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## Protecting Your IT Facility

AVTECH Puts Its More Than 25 Years Of Experience To Work  
Designing & Manufacturing Environmental Monitoring Hardware & Software

**WHEN LIFE THROWS** your business a curveball, sometimes you take a different approach. Even if it involves moving across the country and reinventing your product line.

Such was the case with AVTECH. Incorporated in 1988 in Irvine, Calif., the company got its roots providing disk, file, and process management tools for VAX/VMS systems from Digital Equipment Corp.

"In 1993, when the market we served disappeared, we scrambled to reinvent ourselves and moved to the East Coast to be closer to Europe," says Michael Sigourney, the company's president and CEO.

In 1998, AVTECH introduced its first Room Alert model and has since become a leader in the market for products designed to monitor temperature and environmental conditions in IT data centers and other facilities.

### Greatest Overall Value

AVTECH has more than 110,000 customers in 177 different countries, including every branch of the U.S. government and military and 87% of the Fortune 1000.

AVTECH's service and commitment to providing the greatest overall value have been key to its success. "Many players

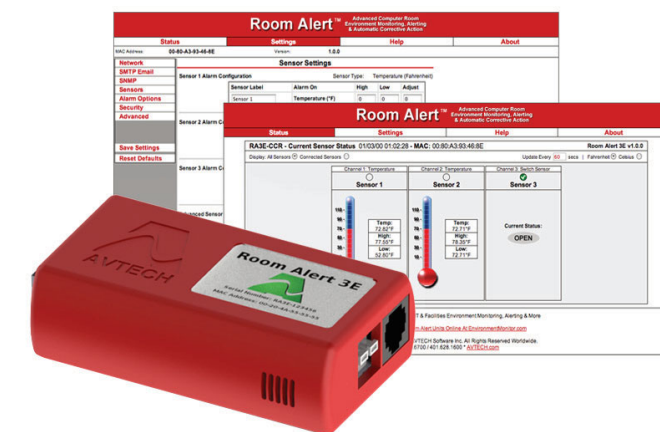
have entered the environment monitoring arena to chip away at AVTECH's market share. After 15 years, Room Alert monitors continue to offer the most cost-effective, scalable, and complete solution available," he says.

Sigourney says that the base price of AVTECH's packaged solutions includes most of what customers want and need. "There is no add-on cost for software, service, or the basic sensors to get started. We include all the cables, printed documentation, and more up front and without any surprises."

The AVTECH Room Alert 3E and Room Alert 32W serve as the bookends of the company's seven-model product line. "If one of these is not the right fit, then a model in the middle will surely meet their needs," he says.

The \$145 3E temperature and environment monitor is powerful, lightweight, and fits in the palm of your hand. It installs anywhere there's an Ethernet connection. The included Device ManageR software lets you easily and efficiently monitor hundreds of Room Alert 3E devices across a worldwide network. "Users often buy one to start and then come back for dozens at a time."

The \$995 Room Alert 32W is a 1U 19-inch rackmount




device that can monitor about 100 sensors utilizing built-in, connected and wireless sensor hub monitoring. "There is more than enough capacity and power to monitor most computer rooms, rows of racks, or a densely monitored facility," Sigourney says.

Built-in sensors include temperature, humidity, heat index, and power, and the base package includes an external temperature sensor, room entry sensor, and a wireless sensor hub. The 32W can handle up to 10 hubs up to 350 feet away. Device ManageR and the first year of support service come free.

### Service & Quality First

"Looking back, I know our service and software quality kept

people coming to us," Sigourney says. In fact, he says, almost nine out of 10 customers renew their support service contract year after year.

"Our people are the difference," he says. "We are just real people that know how important what we do is for our customers. We treat them with respect and try to understand that they don't want to be our best friend. They have a need for what we do and want a good solution, backed by good service, at a fair price. This is what we work hard to provide." 



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The screenshot displays the Processor.com website. At the top, there's a navigation bar with links like Register, Contact Us, About Us, and My Personal Library. Below this is the Processor logo and a tagline 'Products, News, & Information Data Centers Can Trust'. A prominent banner encourages users to 'Sign Up For A FREE SUBSCRIPTION'. The main content area is divided into several sections: 'This Week's Issue' featuring an article on 'Color PDUs', 'Tech & Trends' with tips on improving data center environments, and 'Data Center Products For Sale' which includes search filters for part numbers and manufacturers. A 'Latest Added - Equipment For Sale' sidebar lists items like 'LUCENT TECHNOLOGIES AccessPoint'. At the bottom, there are sections for 'Advertising', 'Subscription Headquarters' (with links to subscribe, renew, or change address), and 'Find Vendors'.

**NEW!** Newsstand

# Finally, Security Surveillance That's Both Simple & Affordable

VIAAS—Video Intelligence As A Service Is Easy To Install, Operate & Maintain

**SIMPLE AND AFFORDABLE ARE** rarely some of the first words enterprise IT professionals would use to describe security surveillance. Setting up a new security system can be complex. Keeping on top of all the updates and new firmware is time-consuming. And budgeting and planning for the new cameras and upgrades you need is difficult.

VIAAS, or Video Intelligence As A Service, changes all that. "It's simple to install, simple to operate, and simple to maintain," says Chris Grillone, president.

## All-In-One System

"We're one of the few, if not only, hybrid edge cloud solutions," Grillone says, adding that some providers have cloud-based offerings, and some have built-in memory on their cameras for storage and viewing, but VIAAS combines both. Because VIAAS is cloud-based, you don't need to invest in a DVR or network video recorder, servers, or video management software.

"Our cameras record motion-triggered video, encrypt it, record it on a MicroSD card, and then use smart bandwidth management to determine the best time to send the video to the cloud for long-term storage."

Built-in 128-bit encryption ensures security at every step. "Video is encrypted on the camera, it's sent to the VIAAS cloud encrypted, and it's stored with 128-bit encryption," Grillone says. Only authorized

users can view, download, email, or save video.

## Low-Cost Investment

There are currently three cameras available—Sparrow, Hawk, and Falcon—which differ based on the video capabilities (HD or D1), wireless, and zoom and focus capabilities. All the cameras are made in the United States.

In addition to the cameras, the only investment is a service plan. Two plans are available depending on the quality of video you need, the number of cameras you have, and how long you need to store video (other options are available on request).

Camera prices start at \$299 and include a one-year service plan; annual service renewals start at about \$119. VIAAS comes with a 30-day free trial.

Perhaps most important, Grillone says, VIAAS can shift your costs from CAPEX to OPEX. "Instead of making a really large investment," he says, with VIAAS, you have predictable OPEX. "Every year, you know you need to budget this amount for your camera system."

## Simple Setup

The system can be set up in minutes. "The only thing you need from us is the cameras," Grillone says.

Once you plug the cameras into an Internet connection, they appear as another computer on your network. With the MicroSD on the camera, even if you lose an Internet connection, video will



still be stored on the camera until the connection is restored.

The cameras require no maintenance, as they automatically communicate with the VIAAS network and look for firmware updates.

The cameras show up in your VIAAS account, which you can access from any Web browser or iOS device, where you can view preview panes of recorded video.

Object-based motion technology captures IntelEvents, or video segments with representative images. Click an IntelEvent to view the full video, regardless of whether it's stored on the camera or VIAAS servers. "When customers are searching for video,

they do not have to worry if the video is still on the camera or if it's in the cloud," Grillone says.

## Easy To Scale

The VIAAS system is low-cost and easily scaled, making it ideal for distributed and growing businesses, Grillone says.

As your business grows, you can keep adding cameras as long as you have enough bandwidth. And because VIAAS doesn't require a DVR or NVR server at each site, the added investment is minimal.

"VIAAS can scale from a single camera to a large multinational company with cameras all over the world," he says. **P**

## VIAAS—Video Intelligence As A Service



A professional-grade video surveillance and monitoring system that encrypts and stores video on the camera, then uses smart bandwidth technology to send the video to the VIAAS cloud for long-term storage.

(408) 342-5570 | [www.viaas.com](http://www.viaas.com)



# Document Filters & Enterprise Search

Most People Get The Idea Of Enterprise Search; Less Understood Are The Document Filters Underlying It

**IF YOU LOOKED** at a Microsoft Word file in binary format (as a search engine needs to review it), the file structure is so complex as to make it nearly impossible to pick out the text. In fact, MS Word documents include not only body text but also fields and often even hidden meta data. And MS Word files can have a nested structure, embedding multiple layers of other documents within the Word file.

Delving through these levels of complexity requires a programmatic implementation embedding a deep understanding of file structure. That is the job of document filters.

Document filters are a dynamic component. Every update, for example, that Microsoft makes to the MS Word format requires an adjustment to the document filters going forward, while still preserving backward compatibility with existing Word files.

One leading supplier of enterprise and developer text search software, dtSearch Corp., has spent over two decades building its own document filters. And the company continually upgrades its document filters to correspond with the release of new data formats.

In addition to Word, other MS Office file types that dtSearch supports include PowerPoint, Excel,

Access, and OneNote. The document filters also support PDF, RTF, OpenOffice, HTML, XML, CSV, and many other file types, along with compression formats like RAR, ZIP, and GZIP/TAR. And the dtSearch document filters support recursively embedded versions of files, such as a Word file embedded in an Excel file contained in a ZIP attachment.

The dtSearch document filters can also support browser-compatible images in files, including recursively embedded files. The document filters further include Unicode support covering hundreds of international languages.

## Document Filters: Not Just For Documents

With so much data now in emails, the dtSearch document filters also support email formats like MS Outlook, Exchange, and Thunderbird. And support extends beyond the email body and meta data to cover multi-layered nested attachments, including recursively-embedded images.

The dtSearch Engine APIs can also work with database data like SQL. While SQL itself is not a file format, it can include BLOB data consisting of embedded documents. The same integrated support for recursively embedded documents, meta data,

images, and the like apply to this BLOB data.

Finally, the dtSearch Spider supports static and dynamic Web data (SharePoint, PHP, ASP.NET, CMS, etc.). This data can further consist of (or simply embed) document data such as HTML, PDF, XSL/XML, or even Office files, all of which require the document filters.


## Beyond Document Filters: Hit-Highlighted Search

dtSearch enterprise and developer products can index more than a terabyte of data in a single index. A single index can span multiple file directories, emails and attachments, online data, and other databases. The products can create and search any number of indexes.

After indexing, the product line supports highly concurrent, multithreaded searching. Indexed search time is typically less than a second, even across terabytes of data. dtSearch products offer more than 25 search options.

For federated searching, dtSearch products support

integrated relevancy ranking across both online and offline repositories. Following a search, the document filters enable hit-highlighting of federated search content.

In the dtSearch Engine, API filters and objects provide an even wider range of advanced data classification options. SDKs include native 64-bit and 32-bit APIs for C++, Java, and .NET (through current versions). 

## dtSearch®



**Desktop with Spider**

**Network with Spider**

**Publish** (portable media)

**Web with Spider** *includes 64-bit versions*

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**Engine for Win & .NET**

**Document Filters**  
also available for separate licensing

*Instantly Search  
Terabytes of Text*

## dtSearch

The dtSearch product line includes enterprise and developer text search products, meeting some of the largest-capacity text retrieval needs in the world. Please see [www.dtsearch.com](http://www.dtsearch.com) for hundreds of developer case studies and press reviews.

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# Committed To Equipment Sales & Repair

Pegasus Computer Marketing Specializes In Point Of Sale, Barcode, Mobile Computers & Kronos TimeClocks

**DO ONE THING**, and do it well. It's an age-old adage that holds true for Pegasus Computer Marketing, which has been in business since 1987.

Although the products and services the company offers have changed through the years, driven by the shift away from mainframe hardware and peripherals, its focus remains on being a total used hardware provider for sales, repair, parts, and complete systems.

Since the late 1990s, Pegasus has been selling and repairing point of sale terminals and peripherals, barcode equipment,

mobile and mounted computers, networking peripherals, and Kronos TimeClocks. It can service nearly any make or model and offers new and used parts and complete systems.

Pegasus performs all depot maintenance, flat-rate repair, sales, and buyouts from its 7,500-square-foot facility in Forney, Texas.

Having a central location allows the company to provide the best in technical and sales staff expertise and stay current on trends and the prices and availability of equipment its customers use.

All hardware sold or repaired by Pegasus is tested, refurbished, and foam-packed for shipment by staff right at its facility, ensuring total quality control and the ability to quickly turn around emergency requests from customers.

The company has stood the test of time and, in fact, still performs repairs and maintenance for some of the same retailers that have been trusting the company since day one, along with countless other companies that need a quality, reliable repair center. **P**



**Pegasus Computer  
Marketing**

- In business since 1987
- Offers repair, sales, and maintenance services all from its Texas location

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[www.pegasuscomputer.net](http://www.pegasuscomputer.net)

## FEATURED PRODUCT

# Cooling Network Switches & Small Spaces

Geist's Opengate SwitchAir & RAC10 Systems Help Solve Unique Cooling Challenges



**COOLING A DATA CENTER** is a tough job, and challenges exist even in environments with the best cooling and efficiency. Such challenges include cooling network switches, which typically are subjected to extreme heat, and smaller spaces without dedicated cooling systems.

Geist's Opengate SwitchAir (pictured) provides a way to cool network switches, load

balancers, routers, and other cabinet devices. Because such devices are typically mounted in

the backs of cabinets to improve cabling, they're subjected to air that is preheated by the servers, creating the potential for critical damage and a reduced life span.

SwitchAir mounts with the intake of the device on the front (cold aisle) of the cabinet, directing cool air using channels and small fans.

The SwitchAir product, which costs as little as \$70,

works in nearly any cabinet with nearly any make and model of switch, and SwitchAir can be installed without powering down or uninstalling the switch.

For enterprises with small data closets, Geist's Opengate RAC10 can help supply cool air.

The self-contained RAC10 system installs in place of a 2x2 ceiling tile or mounts between wall studs. A remote temperature probe mounts on the front of a rack. When the unit is on, hot air from the room is evacuated using temperature-controlled, variable-speed fans. This allows cooler

building air to flow into the room through a vent.

The system, which costs less than \$2,000, provides real-time environmental feedback via a network user interface. **P**

### Geist's Opengate SwitchAir

- Can be installed in a live working environment
- Available in a variety of configurations, from 1U to 9U

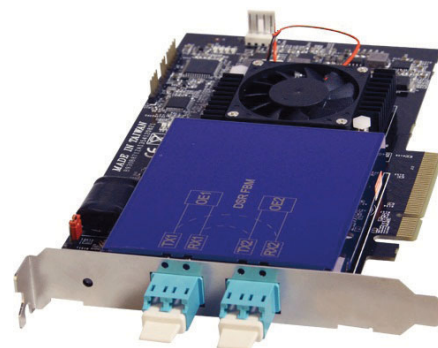


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[www.geistglobal.com](http://www.geistglobal.com)

# Keep The Network Running

Portwell BPC-54120 Is Based On The Intel 10Gb Ethernet Controller & Features A New 100% Software-Controlled Bypass Interface



**LET'S SAY** your enterprise relies on backbone servers for unified threat management, firewall, load balancing, or WAN acceleration where high availability is critical. You can't afford to have a system failure or power loss impact your network.

Sound familiar? If so, a network adapter with failover/bypass capabilities is essential.

The Portwell BPC-54120 bypass module uses the Intel 82599ES 10G Ethernet controller with Direct Cache Access. It provides high-speed connectivity from board to board without any exposed cable.

Portwell's Gen 3 bypass design is 100% software-controlled. It features a simple command-based protocol that communicates between the hardware and driver.

An external hardware jumper lets you enable or disable the bypass function. Under Normal mode, data flows from the network to the CPU. In the event one of your inline appliances fails because of a software crash, power outage, or other issue, Bypass mode allows data to flow into one port and flows to the next available network device.

The BPC-54120's Watchdog Timer checks for network

issues as often as every second. If a host system does not refresh, the Watchdog Timer executes a preset command such as setting the relays to bypass or open mode.

The dual-port one pair segment Portwell BPC-54120 has a PCI-E 2.0 interface and includes support for IEEE1588, 802.1AS, and JumboFrame. Virtualization support comes in the form of Virtual Machine Device Queues and PCI-SIG SR-IOV.

Add in the BPC-54120's durable hardware design, and you have an adapter that offers

more reliable network traffic, higher throughput performance, and longer product life than any other product on the market. **P**

## Portwell BPC-54120

- Intel 82599ES 10G Ethernet controller
- Gen 3 bypass design
- PCI-E 2.0 interface



(510) 403-3399  
www.portwell.com

# Climate Monitoring In A Compact Package

ITWatchDogs WatchDog 100 Monitors Temperature, Humidity & Dew Point, With No Software Required

**IN WHAT CAN BE** a crowded, confusing market for products designed to monitor the environmental conditions of your data center, the WatchDog 100 from ITWatchDogs is a compact, affordable competitor.

At just 1U by 8-1/2 inches, the WatchDog 100 is perfect for tight installations. The rackmount brackets (as pictured) offer flexible wire management options but can be removed or repositioned as needed to simplify installation.

The self-contained \$279 WatchDog 100 has a one-year warranty and comes with



temperature and humidity/dew point sensors onboard.

There are four analog inputs for dry contact or 0-5 VDC sensors and a digital sensor port allowing you to connect an additional four sensors using a 5-port splitter. Optional sensors include monitors for conditions such as airflow, water and smoke detection, door position, and power failure.

All you need is a Web browser to be able to view real-time sen-

sor readings, complete with graphs for trending and capacity management. The device offers three access account levels with flexible rights and security settings.

Using the Web interface, you can establish alert parameters. If the temperature or humidity fall outside of those thresholds, you can receive alerts via email, email-to-SMS, voice,

and relay. A relay output can trigger external devices such as an auto-dialer in case of alarm. Escalating alerts ensure additional personnel are notified as needed. **P**

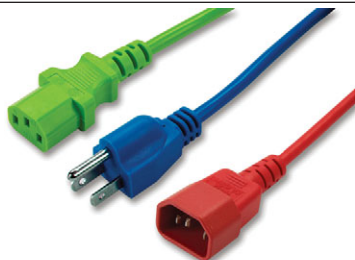
## ITWatchDogs WatchDog 100

- Temperature and humidity/dew point sensors onboard
- Can add eight external sensors
- Secure Web interface



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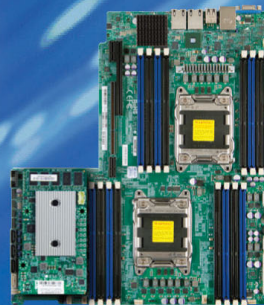


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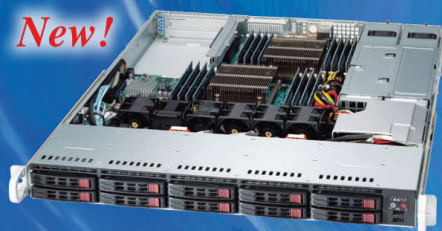


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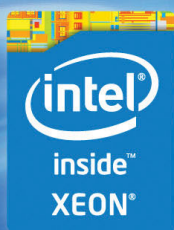


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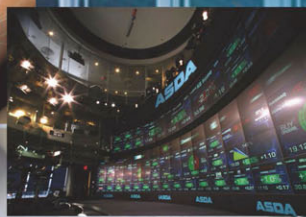
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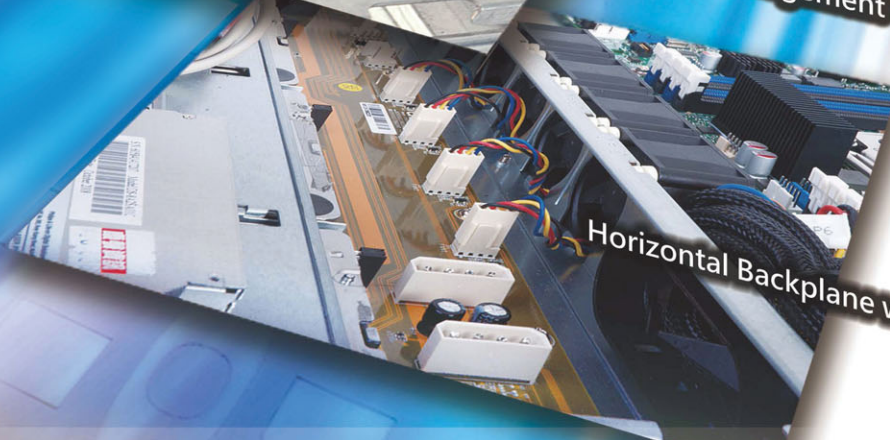


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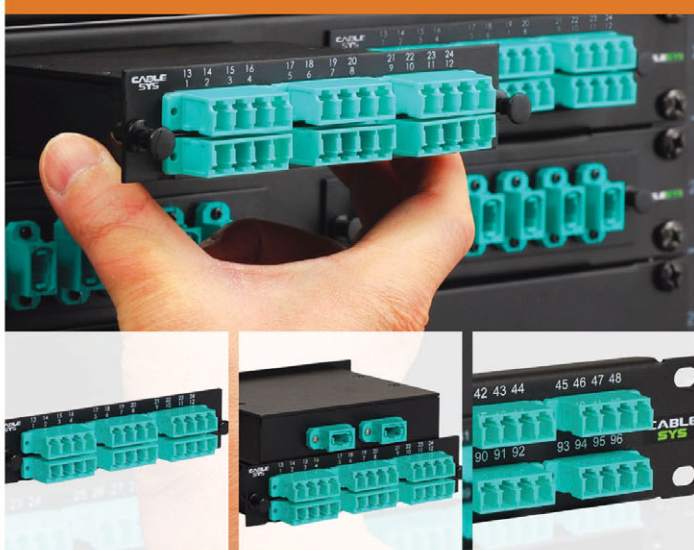
## Jumpers



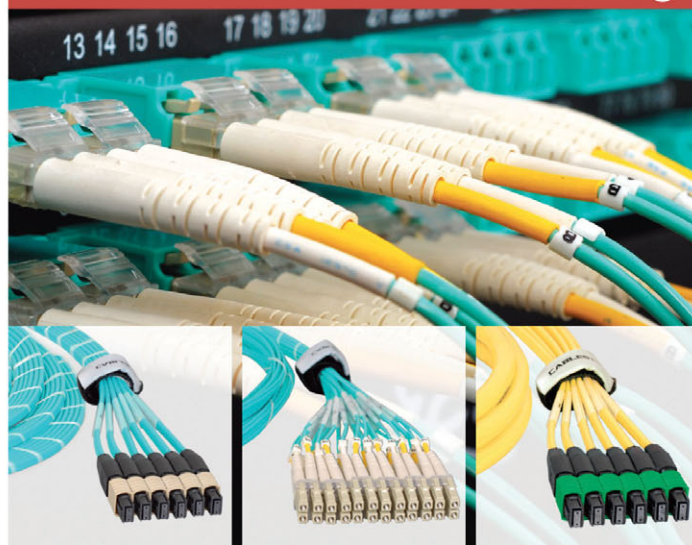
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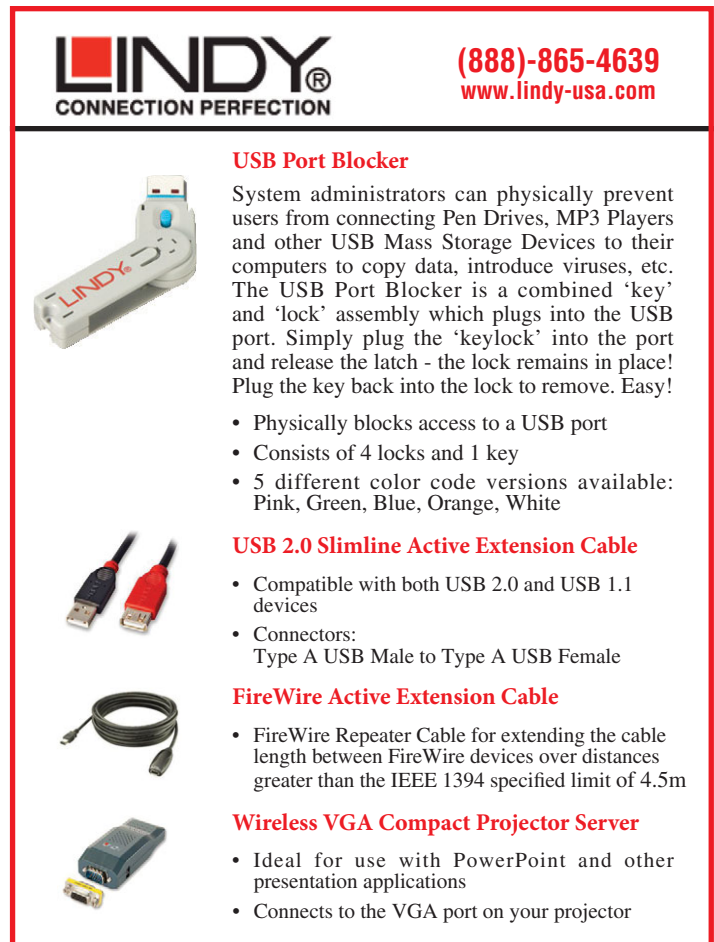
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## Survey Looks At Gaps In Information Sharing

Organizations across a range of countries and cultures recognize the importance of sharing information with stakeholders, but they're failing to do so. A survey by Information Builders shows that information sharing is largely restricted to knowledge workers and executive and midlevel management. Operational employees (non-IT employees who rely on company and customer information), as well as customers, partners, and suppliers, aren't always likely to receive the information they need.

### Other key findings:

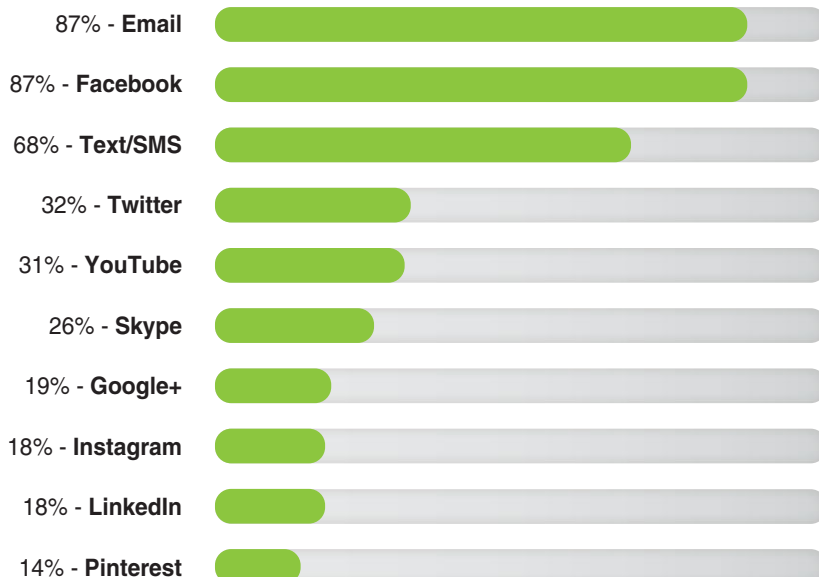
IT managers are not focusing enough on innovation, new revenue generation, and increasing customer retention. Those three areas, Information Builders reports, hold great potential and could benefit from a more encompassing information-sharing strategy.

American IT managers are more likely than their European counterparts to use information for innovation, revenue generation, and customer retention.

Respondents from the United States were least likely to believe that all employees should have access to information to be more effective.

## Email & Facebook Neck & Neck For Primary Communication

The Buntin Group ad agency and Survey Sampling International recently conducted a survey asking U.S. Web users what forms of online communication they had used in the previous week. The survey found that the social networking site Facebook is now about even with email as the most frequently used mode of communication, followed by text messaging. Here are some additional results:



## Emerging Markets To Boost Tablet Sales

Next year, shipments of tablet PCs will more than double shipments of standard notebook and ultra-slim PCs, according to stats from NPD DisplaySearch. The research and consulting firm expects 364 million tablet PCs will ship next year compared to 177 million notebooks and ultra-slim PCs. Tablet shipments will increase across all regions but most particularly in emerging markets. By 2017, the gap between tablet and notebook sales will widen; NPD DisplaySearch expects 589 million tablets to ship that year compared to 176 million notebook and ultra-slim PCs. "Supply chain indications reveal that previously planned production of notebook PCs is being pulled back due to declining adoption and that brands are gradually increasing the number of tablet PC models in their product mixes," says Richard Shim, senior analyst with NPD DisplaySearch.

## "Disruptive Forces" Can Impact IT Asset Costs

Most CIOs say reducing the cost of IT is one of their top three priorities, according to the 2013 CIO Survey from Gartner,



but several disruptive forces could lead to sudden increases in IT costs. Gartner notes that maintenance fees, for example, are rising steadily as software vendors become increasingly reliant on the fees,



which often generate profits of 85% or more. IT asset management professionals also need to be prepared for software audits, Gartner reports, as audits are becoming more intense and more difficult to defend against. In addition, cloud computing's impact is being felt across the industry, and ITAM leaders need to be able to provide accurate cost models comparing traditional IT and cloud services, along with benefits and risks.

### ■ Gartner: Resistance To Public Cloud Subsiding

Offshore providers need to develop a cloud strategy and invest in the shift to the cloud



in order to survive, according to Gartner. Service providers that are slow, unable, or unwilling to make the shift risk losing revenue, Gartner reports. The research firm expects end-user spending on public cloud services to be up 18% this year to \$131 billion and exceed \$180 billion by 2015. "The initial resistance to public cloud has begun to subside, and customers are beginning to realize its efficiencies as the solutions mature," says Ian Marriott, research vice president at Gartner. The most successful providers, Gartner notes, will have a balanced portfolio of managed services and traditional delivery approaches in addition to cloud offerings.

### ■ File- & Object-Based Storage Drives Growth In Overall Market

The overall market for enterprise storage systems continues to grow, thanks in large part to great momentum for file- and

object-based storage (FOBS), according to IDC. "The future of storage is software-based," says Ashish Nadkarni, research director, storage systems. "FOBS solutions are much more versatile and will quickly outpace more rigid, hardware-based options." Scale-up solutions such as file server and appliances will have sluggish growth through 2016, Nadkarni says, while scale-out file- and object-based solutions will have a CAGR of 24.5% between 2012 and 2017. Recent IDC research also shows that DIY storage will become more prevalent and that storage traffic is undergoing a dramatic shift caused by the growth of IP-based connectivity for mobile, social, and cloud.

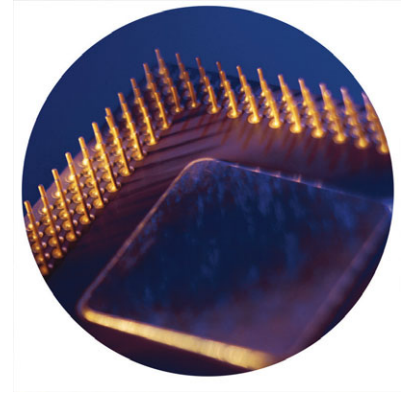
### ■ CIOs Must Stop Being Compliance Rule Followers

For years, the need to comply with industry and government regulations was the driving force behind IT risk and security planning. But that needs to change, according to Gartner, with compliance simply an outcome of a well-run risk management program. "By simply trying to keep up with individual compliance requirements, organizations become rule followers, rather than risk leaders," says John A. Wheeler, research director at Gartner. "CIOs must stop being rule followers who allow compliance to dominate business decision-making and become risk leaders who proactively address the most severe threats to their enterprises." Gartner says risk leaders should track regulatory and business changes to evaluate their compliance risks, then create a plan to address compliance requirements in a way that improves resilience and business success.

### ■ Tablet, Cellphone Processors Set Market Pace

Microprocessor sales are expected to reach a record high this year as increased demand for tablets and cellphones make up for the decline in demand for PCs. IC Insights' mid-year forecast shows microprocessor sales reaching \$61 billion this year. Sales of x86 processors will account for 56% of the market,

followed by cellphone processors with 26%, embedded with 11%, tablet with 6%, and other computer CPUs with 1%. Processor shipments for multimedia cellphones will be up 30% this year, IC Insights notes, while processor shipments for touch-screen tablets will be up 54%. Sales of processors for PCs, servers, and similar devices will be down 6% this year.



### ■ Other Noteworthy News . . .

#### Smartphone Sales Continue

**Substantial Growth:** Little surprise here: The latest figures from Juniper Research show that smartphone shipments increased 50% from last year. Total shipments surpassed 230 million units in the second quarter of this year, which was up 13% from the first quarter.

#### Business-To-Consumer E-commerce Sales Climb, Thanks To Emerging Markets:

Research group eMarketer expects B2C e-commerce sales to reach \$1.2 trillion this year. Much of the growth will come from the Asia-Pacific region, where sales will be up about 23% year-over-year. Sales will be up about 17% in the United States, partially because the market is already fairly mature, eMarketer reports.

#### Google, Microsoft Lead The Way In Search:

About 67% of all online search queries conducted in July were on a Google site, according to comScore qSearch. Microsoft sites accounted for about 18% of all searches. Those percentages equate to about 13 billion searches on Google sites and about 3.5 billion searches on Microsoft sites.

# Simple Ways To Maximize The Value Of Virtualization

Know Whether Deployments Are Giving You A Return On Their Investment

**WE'RE PAST** virtualization being a hyped technology promising many benefits. Today, virtualization is established, and the payoffs it can deliver concerning reduced physical servers and power and energy consumption and bolstered IT efficiency and productivity are well known.

Research indicates most enterprises have adopted virtualization in some form. The question now is if enterprises are seeing the ROI they expected and are maximizing the value of virtualization investments. Here's a look at some mistakes that result in lower ROI or less value and tips to help maximize the value you're getting.

## Just Do It

For enterprises that still have concerns about virtualization and whether it is worth

the investment, the answer seems to be a resounding yes.

"Customers who embrace virtualization and understand its value/limitations often have a great perspective on what virtualization means to the organization," says Mark Margevicius, research vice president at Gartner. He hails virtualization as a "transformational technology" that has generated value in areas of cost, ROI, operations, efficiency, scale, and performance. "By all measures, virtualization is a grand-slam success for nearly all customers," he says.

Dick Csaplar, Aberdeen Group senior research analyst, virtualization and the cloud, says Aberdeen research shows that as of April 2012 about 55% of all applications were deployed on a virtualized server, though they tended to be



smaller, tier 2-type apps. Tier 1 apps (SAP, email, database, and mission-critical) are virtualized to a much lower degree, he says, but "even at this rate [virtualization] has provided very dramatic results, especially reducing the number of servers in the data center." Although "virtualizing the remainder" won't provide as dramatic results, he says, it's "definitely worth the effort."

Csaplar notes that storage virtualization is less widely deployed and can take many forms, plus returns vary depending on what enterprises do. Storage virtualization can help companies struggling to deal with "exploding" amounts of data, although data tiering, decompression, and deduplication can also produce significant savings, he says.

"Desktop virtualization is the least widely deployed and generally has been implemented for only a portion of each company's workforce," he says. Benefits here relate to enhanced

employee efficiency, rather than dramatic savings on new hardware or reduced head count.

## Quantify The Value

Margevicius says quantifying the value of virtualization efforts depends on the implementation. Some companies do little quantification of value, while others adopt virtualization as best practice for IT operations, he says.

Initially, enterprises built server virtualization projects on cost savings associated with deploying fewer servers, he says. Storage virtualization efforts were built on the same premise, "so real dollars can be saved," he says.

Typical ROI from deployments can vary greatly. A common thread among nearly all customers, Margevicius says, is "a better operational state is derived from virtualization, so that flexibility, redundancy, failover, and business continuity are common outcomes from virtualization projects."

## Know The Costs

Data center managers should expect senior management to seek out more information concerning the costs of virtual installations, according to an article written by Forrester Research senior analyst Dave Bartoletti.

Data center managers, for example, should take the time to compile information such as the incremental costs of deploying a new virtualized application in a present virtualization environment and tracking annual costs related to managing and maintaining a VM. Bartoletti writes that data center managers should be able to articulate their virtualization workload unit costs if asked to defend them.



Csaplar says typical ROI regarding virtualization deployments fluctuates greatly based on company size, age of existing infrastructure, and the degree of virtualization implemented. "It's safe to say that with so many companies deploying server virtualization, it gives a very positive return given the wide and deep deployment," he says.

When enterprises deploy server virtualization to the oldest servers with the lowest utilization, he says, they generally expect a "10-to-1 reduction" in server numbers in their data center," Csaplar says. The total lessens as applications grow larger and installed servers are no longer old and slow. Companies can expect better operational performance, "as deploying new applications to a virtualized server is much faster, and dealing with managing the infrastructure is much easier," he says.

## Look Ahead

Margevicius says all aspects of IT infrastructure are under consideration for virtualization, including storage, desktops, applications, and the network. Csaplar expects the next wave of data center transformation to involve the private cloud space.

"Virtualization, instead of widespread server sprawl, can create widespread VM sprawls," he says. Private clouds bring these VMs under one management umbrella and provide tools

to charge the organizations gaining the benefits with the right financial charges. Private clouds also empower end users to self-administer their own server infrastructure and give them "immediate returns and responsibility for their charges."


Margevicius says, "What the cloud has done for virtualization is create massive economies of scale whereby customers who leverage cloud typically receive best-in-class pricing and service from providers." The cloud's future contribution to virtualization, Csaplar says, will include enabling IT to migrate from "being a cost center and supplier of IT computing producer" to being a partner that brokers computing cycles from various sources (internal and cloud-based).

## Avoid These Mistakes

A tendency when looking at ROI in any area is focusing

only on costs. Margevicius says those that do "are selling themselves short" on virtualization's value. Virtualization, he says, is really about "transforming how organizations provision IT resources far more effectively and efficiently, which in turn yields real business value outcomes."

Another mistake is not recognizing that VM sprawl can replace server sprawl.

"It's so easy to deploy new VMs that they get spun up but never taken down," Csaplar says. "Companies need to have lease time limits that set kill dates for expired projects." 

## Prepare Yourself

Most sources on the subject agree that a majority of enterprises are using virtualization to some degree, including deploying applications on virtualized servers. Nearly all sources report the results of doing so can return benefits across multiple areas, including benefits that can be categorized as being dramatic.

"The easy stuff is done," says Dick Csaplar, Aberdeen Group senior research analyst, virtualization and the cloud. Moving forward, he says, benefits in desktop virtualization, for example, won't necessarily relate to savings tied to reducing equipment but have more to do with improved efficiency.

## BONUS TIPS:

### Test, Test, Test

When it comes to virtualization deployments, Mark Margevicius, Gartner research vice president, suggests that enterprises "test, test, and test some more." In addition to testing, Margevicius says, employing processes and tools is also key to realizing successful

implementations, "as the 'how' and 'with what' to manage virtual environments are very different than non-virtualized environments."

### Investigate Private Clouds

Dick Csaplar, Aberdeen Group senior research analyst, says although small and midsized companies have been quick to adopt server virtualization, they have been slower to adopt

private clouds. He recommends companies investigate what this form of technology can do and offer in terms of a company taking "the next step in the data center transformation." To maximize virtual deployments, Csaplar suggests researching and selecting a private cloud infrastructure management application that can transform a highly virtualized environment into a private cloud.

# Build An Environmentally Friendly Data Center

Considerations For Renovations & New Builds

**AMPLE RESEARCH** and evidence compiled in recent years suggests there's much to gain by implementing environmentally friendly features and components when renovating or building a new data center. Here are some benefits and considerations to keep in mind as you're looking at whether these improvements make sense for your data center.

## Explore The Alternatives

Considering the capital costs involved and colocation and cloud computing services available, it's natural to ask if building a new data center even makes sense. Even the smallest and least resilient designs can cost several million dollars, says

Andy Lawrence, vice president of research for data center technologies at 451 Research. As such, building a new data center often isn't an option for smaller companies. Medium-sized organizations may have good reasons for doing so, including security, use of specialist computers, proximity requirements, connectivity and power availability, and tax efficiency and capital appreciation, he says.

Overall, Lawrence says, building small, isolated data centers doesn't make great sense. Companies considering doing so should look at prefabricated modular designs, which can be energy efficient, or leasing dedicated space inside



a larger wholesale data center provider, he says.

Jenna Maertz, consulting analyst at Info-Tech Research Group, says while colocation and cloud services can be tempting when you need to increase capacity, there are situations where building is the right call.

Although cloud computing can seem cheap upfront, for example, projecting costs out for years two through six may show the assumption isn't entirely accurate, and you might "pay significantly more for cloud storage than you would be if you hosted it onsite," she says. Latency and compliance and privacy concerns can also necessitate hosting data onsite. "You lose latency when you use cloud services, and that is fine for some applications, but others will require that near-real-time latency," Maertz says.

## Weigh The Pros & Cons

There's no hard-and-fast rule to determine if a new

build is a better option than a retrofit, Lawrence says. Generally, he says, small legacy data centers are inefficient compared to modern ones, while layout and integrated cooling and power systems can make retrofitting difficult—a situation that may require consulting with a specialist engineering firm. A big factor will be the extent to which existing operations are disrupted, he says.

Anu Elizabeth Cherian, senior industry analyst at Frost & Sullivan, says ROI is the real deciding factor. Companies have adapted to the low-spending market scenario to offer systems that serve as a retrofit to existing systems and enable phases of change, she says. "This serves well to get started on the new platform, as well as enable smaller initial investments. Nevertheless, it sets [companies] on a path toward changing the total efficiency of the system," she says.

## Power Considerations

Your choice of power is a major consideration in building an environmentally friendly data center. Info-Tech Research Group consulting analyst Jenna Maertz says location plays a big role when building an environmentally friendly operation. "Data centers located near natural sources of energy will want to build (or renovate an existing data center) so that it can take advantage of natural drilling, geothermal energy, or hydroelectric energy," she says.

Along with that, Andy Lawrence, vice president of research for data center technologies at 451 Research, says although there are innovative methods for reducing power usage in the power chain, the benefits can be marginal and expensive. "Flywheels may be a good option in place of batteries, but the use of direct current, or fuel cells and other innovations, will likely be beyond smaller businesses," he says. "Higher voltage distribution may also have some benefits, although this is mostly for larger data centers."



Maertz says most organizations begin renovating a data center after about 7-1/2 years, although the longer the wait, the more expensive it becomes. "At some point, the cost of renovating will overtake the cost of starting new," she says. "As technology changes, the data center's design requirements change, and the cost of updating them may be higher than the cost of starting new."

Cherian adds that only a certain amount of backup power equipment will fit in a given space. Once maxed out, the data center is in an expansion phase and there's little point in investing in the existing setup.

### **Involve The Right People In The Process**

Renovations and new builds can be huge, complex endeavors. As such, be sure to involve executive management, facilities, and IT heads, Lawrence says, and enlist any corporate social responsibility personnel in an advisory role to ensure options for improving the environmental sustainability aren't missed.

Maertz says to consider external help. "Knowing how a data center runs, knowing its daily rhythms isn't enough to know how to build a data center." Acquiring necessary specialty skills may mean hiring a consultant. If hiring general

contractors, she says, ensure they have specialized data center knowledge.

### **Consider These Elements In A Renovation Or Build**

Floor space and layout are two areas where you can implement environmentally friendly touches in renovations and new builds. Use designs that keep energy usage to a minimum, efficiently handle heat ejection, and support the processing needs, Lawrence says.

"In most cases, this will be a hot aisle/cold aisle layout with enclosures to ensure there's good airflow," he says. "Raised floors are less common than they were and can be more expensive, but they can provide more flexibility in the long-term."

Nearly all new data centers can benefit from using free air cooling and evaporative (or adiabatic) cooling, Lawrence

says. When combined with operating the data center at the higher end of recommended temperature ranges, significant energy savings are possible, he says.

Another possibility is building the entire data center without

mechanical chillers. "This may be a good option for data centers able to operate at lower power densities," Lawrence says. "Water cooling can be very efficient but is not cost-effective for data centers with average density requirements." <sup>1</sup>

### **Tools To Use**

Whether you're planning to build a new environmentally friendly data center or renovate the existing data center, Frost & Sullivan senior industry analyst Anu Elizabeth Cherian says a main point for companies to address is "efficiency and total PUE (power usage effectiveness) as a function of the backup power equipment installed in the system."

Andy Lawrence, vice president of research for data center technologies at 451 Research, says ongoing and predictive monitoring is also essential for modern data centers. DCIM systems enable forecasting and capacity planning and ongoing management. CFD, meanwhile, is most valuable where designs aren't proven or where heat flow presents particular challenges, he says.

## **BONUS TIPS:**

### **Upgrade Your Servers**

Andy Lawrence, vice president of research for data center technologies at 451 Research, says one of the biggest ways to save energy in the data center is recycling servers every two to four years "so that the benefits of newer technologies and reduced power consumption

are realized," he says. Couple this with virtualization and consolidation so that super-efficient servers aren't doing too little and consider low-energy servers but with performance implications examined carefully, he says.

### **Go Modular**

Info-Tech Research Group consulting analyst Jenna

Maertz advises using a modular approach when designing a new data center. A large provider, for example, might build 30,000 square feet but only bring 10,000 square feet live at a time. "They can then easily expand it without taking the building down. In the interim, they just use temporary walls to control the cooling," she says.

# Is The Password Still Enough?

Consider These Alternatives & Advice For Choosing The Best Fit

**SEEMINGLY EVERY WEEK** there's another report of a cyberattack against a company in which usernames and passwords were compromised. With so much to lose in terms of data, intellectual property, and customer trust, it's natural for enterprises to ask if they're doing enough in the realm of authentication.

## Know The Cost Implications

Given the constant threats and attacks now occurring, are passwords enough? Michela Menting, senior analyst at ABI Research, says it depends. Implementing two-factor or multifactor authentication for all situations would be ideal, but cost and flexibility considerations

aren't always practical. If allowing remote workers and personal devices, for example, definitely consider two-factor authentication. (A mobile device can serve as a teleworker's second authenticating factor.) If not, IDs and passwords can be sufficient for employees with limited access to sensitive data and corporate resources, she says.

But IDs and passwords offer only basic security when using remote connectivity tools, cloud services, or mobile devices, she says.

Derek Brink, vice president and research fellow at Aberdeen Group, says although he'd like to see the demise of usernames and passwords, they remain the default and most common



means of authenticating users to enterprise resources.

A big perception, however, is that passwords are "good enough" security and cost less than stronger alternatives. "Aberdeen's research has actually shown this not to be the case," he says.

## Apply Risk-Based Data

One question regarding authentication is whether two-factor and multifactor authentication should actually be required among businesses.

Bob Tarzey, an analyst and service director at Quocirca, says this would occur only if regulators mandated it. Regulators, he says, worry more about data protection and if organizations leave themselves vulnerable through poor access-management policy. Two-factor and multifactor authentication make good business sense when there's a practical way to implement it, he says.

Brink says companies should "make informed, risk-based

decisions about security and then be held accountable for the consequences." However, he says, evidence is against there being "any meaningful consequences due to the normal market forces between buyers and sellers."

Menting says two-factor authentication should be required, as cyberattacks will continue to be common. Employees need to accept they should use multiple passwords for multiple logins, even within the enterprise, she says. "But this is difficult and complicates the process, so using two-factor authorization simplifies things. You can reuse the same password as long as you have a token. It's a matter of finding the least intrusive way to ensure security," she says.

## Eye The Alternatives

For small to midsized enterprises, two-factor authentication is much less expensive than multifactor, Menting says. "This

## Stay Abreast Of Regulations

Directive 95/46/EC is among the data-protection regulations that IT and data center managers may want to explore, says ABI Research senior analyst Michela Menting. She says the European Union is in the process of updating the directive "with the aim of modernizing data protection and privacy for the digital age and enabling better harmonization across Europe."

The EU has also announced a new Cybersecurity Plan that could require companies to report data breaches to respective national regulatory bodies. The United States has been slower on this front, she says, though a recent cybersecurity order from President Barack Obama is "aimed to prompt more information sharing and voluntary security certification among private sectors operating critical infrastructure." A Cyber Intelligence Sharing and Protection Act (CISPA) draft could affect federal bodies and the private sector in technology and manufacturing sectors, she says.



allows for a dynamic password that can be generated through something the employee will have.” An inexpensive solution is having cards with codes or patterns unique to the user, she says. Keyfobs or small calculators that generate random codes are more expensive.

Mobile devices are also proving reliable and popular for providing two-factor authentication through SMS or mobile apps, and biometrics is another possibility, she says. Facial or voice recognition are now more reliable but need more development for enterprise-level security affordable for smaller enterprises, she says.

Tarzey says mobile phones enable introducing “a third vector: context-aware security.” In other words, does the phone’s location make sense considering what’s known about the user? For example, an authentication attempt made from China could indicate a problem, he says.

One problem with all forms of strong authentication, Tarzey says, is “you can’t easily put it in place for every different application. The solution to that is to use an SSO (single sign-on) system.” SSO is possible for on-demand (cloud-based) and in-house applications, he says, and increasingly available as a cloud-based service, making it affordable and easier to implement.


## Decide The Best Fit

Enterprises settle on a protection approach based on what’s a good fit. “There are always tradeoffs between productivity and convenience for end users, security and risk of the resources being accessed, and total cost—including cost to acquire, cost to integrate and deploy, and cost to manage over time,” Brink says. Exhibitors at the recent RSA Conference, he says, showed that “after all these years, there are still tens of companies actively aiming at the problem of passwords.” So many still exist and companies continue to form “because of this age-old trade-off,” he says.

Tarzey says beyond the application being accessed, companies must consider who is accessing it. As such, access policy can vary among in-house

employees, remote workers, contractors, and consumers.

Menting recommends weighing costs against security needs and employee practices. “How sensitive is the data stored? If it’s subject to regulatory compliance, then it needs additional security, and cost considerations need to

come second,” she says. If allowing employees to work remotely, a higher level of security is needed for those remotely accessing the network. Also consider partitioning or segregating data within the network and applying different security and restrictions to different data. 

## Know What's Influencing Passwords, Security

Aberdeen Group vice president and research fellow Derek Brink says big data, social networking, mobility, and other developing fields are influencing password usage and security philosophies in several areas. These include increased awareness of the vulnerabilities of traditional passwords; poor behavior on the part of end users with respect to password choices (using 12345, for example); reinforcement of best practices for securing passwords (using salting and hashing, for example); usage of real-time information to make authentication-related decisions (such as adaptive authentication); usage of ubiquitous mobile devices as a platform for stronger authentication options; and actual and threatened regulations around authentication and security.

## BONUS TIPS:

### Use Password Best Practices

Derek Brink, vice president and research fellow at Aberdeen Group, says if companies do rely on passwords, they should implement best practices in terms of protecting the password database(s) through techniques such as salting and

hashing. He says public disclosures in recent years have shown even marquis brand names haven’t always done so.

### Safeguard Privacy By Using Tokens

In addition to adding costs, requiring multifactor authentication can be an additional burden for employees, says Michela Menting, senior

analyst at ABI Research. “The use of tokens requires carrying around an additional device that can easily be forgotten or lost,” she says. “For this reason, using mobile devices as this token could be ideal.” Using biometric information, however, adds a privacy issue, so “enterprises need to ensure that they safeguard that information accordingly,” she says.

# Troubleshoot Problems With Cooling Equipment

Keep Your Cool When Faced With Issues That Keep Equipment From Running Efficiently

**ANYONE WITH A BIT** of knowledge about the inner workings of a data center knows the importance of HVAC systems and cooling equipment. Summer months only add to the stress such equipment is already under.

But just because we're heading into the cooler fall months doesn't mean managers are out of the woods. The following details common problems, troubleshooting advice, and preventive measures regarding HVAC and cooling equipment.

## Adjust To The Season

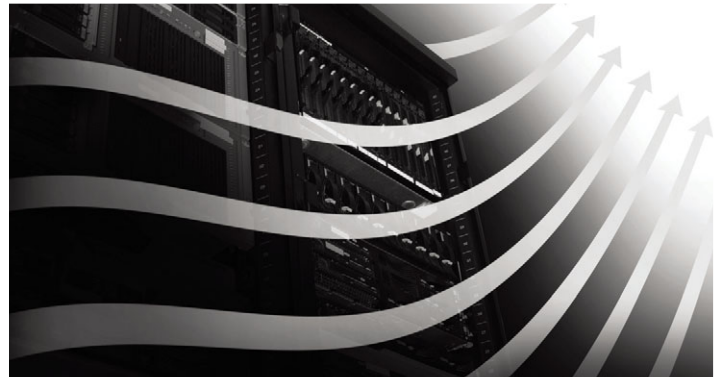
Different seasons present managers with specific issues related to HVAC and cooling systems. Ken Koty, sales engineer at PDU Cables (866/631-4238; [www.pducables.com](http://www.pducables.com)) and a former data center manager, says cooling systems work their hardest in the summer, and "if there are going to

be problems, inefficiencies, or system failures, they're more likely to occur then."

The added stress on mechanical parts can cause them to wear more quickly and need replacement sooner. Heat and constant use during summer months also impacts the effectiveness of chemicals in the cooling system. You'll need to pay closer attention and increase inspections of HVAC and cooling systems during these months.

Steve Wellander, technical service manager at Data Aire (800/347-2473; [www.dataaire.com](http://www.dataaire.com)), says as we head into fall and winter, the need for dehumidification subsides.

"Now, the season will be humidification," he says. "If your units are equipment with humidifiers, they should be serviced." Managers should check the standard steam generator, he says, and if the



humidifier cylinder is spent, it will need to be replaced.

## Be On The Lookout

Knowing what problems are possible will put managers in a better position to react.

Wellander says most issues in a data center aren't mechanical or electrical. Instead, most issues relate to cooling equipment working outside the design of the room, meaning "the set points for the temperature or humidity are set at a point that the CRAC units cannot achieve a balance with the load and room," he says. An example is a humidity set point being too low in a room with no true vapor barrier. "The set point may be reasonable for industry standards, but due to the construction of the room, it may not be achieved," he says.

Koty says dirty cooling coils and filters can decrease performance, so managers should clean and replace filters more often to keep systems running at peak capacity.

## Key Points

- Different seasons pose different issues that managers must be prepared to address.
- Some preventive and troubleshooting tasks are better left to professionals.
- Data centers should have a maintenance plan in place that contains specific scheduled tasks to perform at regular intervals.

Low coolant levels also pose trouble. "Even closed systems will experience a loss of coolant over time," he says. Additionally, belts that are worn, too loose or tight, or misaligned can cause premature and sudden equipment failure. A whining blower motor, for example, should be an early warning sign of possible failure and a need for maintenance/replacement.

Koty says loose wires, which can result in overheating and

## Get Started

Beyond making investments in alarm systems that can report anomalies with your various cooling system components, data center personnel should consider having several other tools.

These include an electronic thermometer to check for hot spots, an infrared scanning device, a Freon leak detector, a manifold gauge to check high and low pressures and to add coolant if it's low, amp and volt meters, coil cleaning solvent, an anemometer to check cubic feet per minute (CFM) and air temperature discharge from perforated tiles, and vibration sensors.



equipment failure, are something to make part of regular preventative maintenance. Also pay attention to worn relay contacts, dirty cooling towers, and a lack of a good chemical treatment program. If using central chillers, schedule maintenance of the internal tubes within the chillers, he says, as clean tubing “greatly increases efficiency of the unit.”

### Fix What You Can

Beyond checking set points and any alarms in place, Wellander says, most cooling system repairs are better left to HVAC technicians. Overall, he advises making sure the cooling equipment isn’t working outside of the design parameters. “The room may have humidity readings a little higher or lower than desired, but it will be within ASHRAE standards. The cooling equipment will not have to overwork controlling humidity levels that it cannot maintain,” he says.


Koty suggests implementing a maintenance program that includes specific scheduled tasks and time intervals. Managers should ensure tasks are recorded and documented and work with a good mechanical cooling company to develop a maintenance program.

Enterprises lacking proper equipment and staffing to execute tasks should hire local vendors, he says, after doing a background check, asking

for references, and checking with those references.

Preventive measures to take include checking all cooling system components are maintained to factory specifications, regularly visually inspecting components, checking CRAC units for coolant leaks using a handheld leak detector, and installing liquid detectors under each CRAC/CRAH unit.

The use of vibration sensors can also be essential, Koty says. “First, establish a baseline reading and then perform regular checks to compare against the baseline,” Koty says. Dramatic increases can signal problems developing and a need for maintenance. Koty recommends a third-party vendor perform vibration-sensor testing.

Above all, if you run a particularly mission-critical environment, Koty says, consider implementing redundant systems. 

### Action Plan

**Eyeball filters.** Inspect and change air filters on a regular basis.

**Tighten up.** Regularly check for loose CRAC/CRAH wire connections.

**Spot bubbles.** Check the sight glass in cooling lines within CRAC units for bubbles, which indicate low coolant levels.

**Get amped.** Check amp readings to blower motors to ensure they’re within ranges posted on motor nameplates.

**Implement training.** Hire a good chemical treatment company to train staff on proper treatment tests and practices.

**Schedule visits.** Ensure that a trained professional visit the site at least monthly to test and inspect systems.

**Scan for issues.** Use an infrared scanner in and around motor housing, bearings, and wire connections on CRAC/CRAH units for hot spots (or hire a professional).

### Top Tips

**Maintain and understand.** Schedule regular maintenance for cooling equipment and understand what equipment can and can’t do in your given space.

**Call a pro.** Ensure a qualified HVAC contractor changes filters regularly along with monthly or quarterly inspections.

**Use your senses.** Perform daily walk-throughs using sight, hearing, smell, and touch (taking care of what you touch) in order to catch problems early on.

**Use sensors.** Using vibration sensors on all motors and pumps can detect worn bearings and misaligned motors. Create a baseline, log the initial readings, and check the readings every six months for increases.

# Troubleshoot Servers

Develop An Efficient Process, Follow It Carefully & Keep A Record Of Every Problem & Solution

**SERVERS ARE THE** foundation of every data center and the backbone of your entire organization. They make it possible to support multiple employees inside of an organization, run applications for business processes and customer service, and much more. If a server isn't running at peak performance, neither is your business.

It's important to understand that no matter how well you run your data center, there will always be failures and other issues that need to be addressed. And while some of them can be prevented, others need to be diagnosed on the spot and fixed in a timely manner. We'll tell you about some of the most common server-related issues and help you develop a troubleshooting process that will prevent downtime and performance degradation.

## Know The Common Physical & Software Issues

It can be difficult to pinpoint specific problems with servers. Jason Harlan, operations manager at ServerMonkey (855/477-8377; [www.servermonkey.com](http://www.servermonkey.com)), says the most common types of physical server issues are with hard drives, CPUs, networking components, and RAID and memory failures. Harlan says memory failures are particularly troublesome because "they can be the most common failures and difficult to isolate." Memory failures can also disguise themselves as networking or program-based problems, so you have to know what to look for.

In addition to physical equipment failures, you may find that some of your software solutions can fail and cause problems, says Greg Schulz, senior advisor at Server and StorageIO.



"Most server issues outside of power, cooling, or lack of maintenance tend to be software-related, which includes operating systems, drivers, hypervisors, or applications."

Software issues are common and can sometimes be remedied by installing the newest firmware update or installing a newer version of the software. But you may not be able to pin down software as the culprit until you first rule out other potential problems.

## Follow A Predesigned Troubleshooting Process

Harlan's memory failure example is a great template to follow during the troubleshooting process. Servers house quite a few memory modules, so the best way to find a problematic one is through the process of elimination.

"A good way to troubleshoot this would be to take the minimum amount of memory it takes to run your server and start by eliminating the suspected bad

DIMM by adding them back one bank at a time," Harlan says. "After you have found the suspected DIMM, replace it with a known good piece. Then, use a memory test approved for the server in question and run it through a complete test to ensure that you have completed the repair."

The process is helpful if you know that the issue is memory-related, but you won't always have that much information. In

## Key Points

- Be aware of the usual physical and software suspects related to server performance problems and rule them out early.
- Start by troubleshooting physical components, such as memory, before moving on to software.
- After you've completed the troubleshooting process and fixed the problem, make a note of the fix for future reference.

## Get Started

The best way to prevent server problems and speed up the troubleshooting process is to have a monitoring solution in place. Server monitoring software can provide alerts that bring issues to your attention before they become major failures.

Some of the most common issues with servers stem from not having the most recent firmware or patches, so in addition to monitoring server performance, you should also consider an asset management solution that helps you keep better track of your hardware and what updates you've installed.



those situations, you need to start with the usual suspects and then move your way out from there.

Schulz says most server problems or failures stem from changes in “hardware configurations, software or settings, or something in the facilities environment.” Look at recent changes you’ve made to your server configuration and determine whether one of those adjustments could be causing problems.

Companies should also take preventive steps such as running a power on self-test (POST) and monitoring “start-up logs and other event notification entries for signs of trouble that something’s not right,” Schulz says. The troubleshooting process will be quicker if you’re more prepared.


### Quickly Isolate & Address The Problem

Once you find the component or piece of software that is affecting your server’s performance, you need to “quickly isolate where the problem is and keep it from spreading or causing a ripple effect on other servers, applications, or systems,” Schulz says.

As previously mentioned, memory failures have a negative effect on networking speeds, application performance, and much more. If you don’t isolate that issue right away, it could affect employee productivity, customer service, and many other business processes.

It’s also absolutely essential to know who is tasked with responding to a specific issue. You may be able to solve the problem with a quick component swap, or you may need to contact the manufacturer for additional help.

If it’s a relatively simple fix, make sure there is a process in place to contact the employee with proper expertise within the organization. If the issue is out of your experience level, don’t hesitate to call the manufacturer or a third-party repair service.

Remember that fixing the problem isn’t the end of the road. Harlan says you need to make a note of what caused the problem and the steps you took to fix it. This information will be invaluable in the future to prevent similar issues or expedite the repair process. 

### Action Plan

The following steps were provided by Jason Harlan, operations manager at ServerMonkey (855/477-8377; [www.servermonkey.com](http://www.servermonkey.com)):

**Develop a routine.** Before issues occur, you should already have a troubleshooting process in place, know whom to contact in case of hardware failure, and be able to quickly address the problem.

**Start with hardware.** Troubleshoot physical layer problems by starting at the bottom and checking each layer to determine functionality and compatibility. Eliminate any hardware conflicts.

**Move to software.** If the problem isn’t at the hardware level, start diagnosing your operating system, software configurations, settings, and updates.

**Keep records.** Make a note of the problem and the solution to help expedite troubleshooting in the future.

### Top Tips

The following tips were provided by Greg Schulz, senior advisor at Server and StorageIO:

**Design for failure.** Isolate and contain faults from spreading or causing bigger incidents, leverage high availability and redundancy, and plan for workload increases as part of the configuration to keep things running.

**Use all available information.** Leverage metrics, measurements, incident logs, and reporting as well as automated analysis tools to spot problems quickly and take corrective action. Leverage your monitoring and management tools to spot trends early and plan for growth. Use diagnostics to quickly determine what works and what does not and to improve change management.

**Determine your normal performance level.** Have a baseline to compare to see what is normal vs. abnormal. Baselines should include performance, response time, server memory, CPU, and network and storage IO activity.

# Use The Cloud To Help Your Data Center

Some Newer Ideas For Projects & Tasks That Could Benefit From The Cloud

**FOR MOST COMPANIES**, it simply isn't possible to move every application, business process, or dataset to the cloud. There are a number of possible reasons for this, including regulatory compliance issues, public cloud security concerns, or a reduced latency requirement for running certain applications.

But just because a few of your applications aren't a fit doesn't mean that you can't take advantage of the cloud. In fact, almost any data center can take advantage of the flexibility, scalability, and simplicity of the cloud. And, in fact, many already have.

## Mobility & Big Data

Many companies are struggling to keep up with the needs of an increasingly mobile workforce. As more and more

mobile devices require access to data and internal resources, data centers may need to beef up their infrastructure in order to keep up with demand.

But where traditional infrastructure is "scale out," the cloud is "scale up," says John Sloan, lead research analyst at Info-Tech Research Group. That means you can gain access to more resources as you need them rather than needing to add additional physical infrastructure to overcome issues. You have the option of creating personal clouds for employees or mobile cloud applications, which opens up new opportunities for mobile data access.

Big data is another major issue that's currently facing data centers, and the cloud could prove helpful. Companies are dealing with "very large, heterogeneous



datasets that are coming from a variety of sources," Sloan says. And while you may store much of that data onsite, it's difficult to analyze without some outside help. That's why Sloan says the cloud is a great resource, because you can scale up your resources during a particularly large data analysis project and then scale them back down after you're done.

These mobility and big data concerns can go hand-in-hand, Sloan says. "If you launch a mobile app that integrates back into the company, you will likely need a very elastic Web backend or portal on it, which functions better in the cloud than on typical converged systems," he says.

"If the app is successful and you have thousands or millions of people using your app, then there could be opportunities to gather real-time data from all of those people. That's the kind of big data analytics problem that cloud services are better at solving," he says.

## Key Points

- Use the cloud's scalability to support application backend and data portals and for big data analytics.
- Add resources as needed for temporary application testing and development projects.
- Reduce infrastructure customization in order to take advantage of the latest and greatest technology.

## Get Started

If you're in the early stages of cloud exploration and are looking for ways to best utilize it, you need to consider which applications are a fit and which ones aren't.

"One of the first things they have to do is triage their applications and put them into buckets," says Rich Fichera, vice president and principal analyst at Forrester. He says applications that are already implemented as virtual machines may be a good fit, but those built on legacy architecture are not. It's important to involve your "user community" as well, because users can help you see the value of moving certain apps to the cloud, Fichera says.

## Application Testing & Development

The scaling capabilities of the cloud can prove ideal for business purposes other than big data analytics.

For instance, Rich Fichera, vice president and principal analyst at Forrester, says that test and development "is a common entry point" for many data centers and that the test and development team inside



your company is often “the most volatile in its use of certain systems.” In fact, Fichera says that test and development was one of the early beachheads for virtual machines in general and that the cloud can serve those teams in much the same way.

App development often requires access to a large amount of computing resources, and if you build out permanent infrastructure to meet those needs, you could end up with equipment you’ll never use again or at least won’t use frequently enough to justify the cost.

With the cloud, you can simply request additional resources during development or if you need to test an application on a larger scale. You only pay for the resources you use, and you don’t have to worry about physical infrastructure collecting dust inside your data center.

## Standardize Systems

Ed Anderson, research director at Gartner, says that some organizations have gone so deep into customizing their infrastructures and applications that it can make it difficult to take advantage of new technology as it’s released. For that reason, some companies are actively trying to standardize their systems in an effort to “leverage the best the industry has to offer,” he says.

The cloud can aid in that standardization process simply because most cloud environments are less complex and more standardized in general.

“One way to think about this is the shift from a current environment that is 80% customized and 20% standardized to a new cloud-based operating model which will be 20% customized and 80% standardized,” Anderson says.

“The switch drives a much more efficient operating model where the organization can take the best from the broader industry and then really focus on the differentiated value exposed through the 20% of their environment that is customized. The key here is that cloud computing acts as a catalyst for making this change.” **P**

## Action Plan

Ed Anderson, research director at Gartner, offers the following steps for cloud development:

**Educate yourself.** Understand all available cloud computing models as well as the marketplace of providers offering public cloud services.

**Consider data and apps.** Determine which applications and datasets are a fit for the public cloud and which ones make sense to keep in-house in a private cloud. Know that not all workloads and processes are suited for the cloud.

**Assess your IT team.** Figure out whether your team is capable of managing an internal or external cloud environment and seek provider help if necessary.

**Introduce cloud services methodically.** Don’t simply opt for every available service. Pick the ones that make sense and implement them in waves.

## Top Tips

John Sloan, lead research analyst at Info-Tech Research Group, offers these tips for deciding which cloud computing options to consider:

**Disaster recovery.** Consider storing certain datasets or applications in the cloud for recovery purposes. If you can upload data to the cloud and then restore it using the same provider, it may prove to be a less expensive alternative than building a second data center.

**IaaS vs. SaaS.** Data centers shouldn’t limit themselves to IaaS-based cloud environments. If you can find a software-as-a-service offering that fits your needs, then you won’t have to worry about investing in more internal or external infrastructure resources.

**Colocation and hosting.** Most data centers will have a mix of data and applications that may or may not be a fit for the cloud, but remember that it doesn’t have to be all or nothing. To start with, you can try offloading some applications to a colocation or hosting provider with similar infrastructure.

# Data Center Best Practices For Backup & Recovery

The Top Tactics, Technologies & Strategies You May Want To Implement

**EVERY DATA CENTER MANAGER** knows the importance of backup and recovery. But that doesn't mean every enterprise is doing all it can in terms of its processes, testing, and efforts to implement more efficient strategies. Here are some tips related to backup and recovery best practices and implementing technologies and tactics other companies find successful.

## Room For Improvement

Greg Schulz, senior advisor at Server and StorageIO, says even enterprises with top-notch optimal conditions can improve or adapt their backup and recovery efforts to support new applications, tools, and technologies or enlist data protection where it should be. Companies using the latest, greatest hardware, software, and virtualization, for example, can still revisit items such

as service-level expectations, needs, wants, costs-to-deliver service, and ways to remove rather than cut costs, in addition to increasing durability while streamlining processes, testing, and more, he says.

David Hill, principal at Mesabi Group, believes the first imperative to improving backup/recovery processes is reducing what needs to be backed up.

Recent research, he says, indicates companies must preserve 1% of data for litigation, 5% for records required by law, and 25% for current business value. "That means 69% of all data has no business value," he says. Although deleting this data would be nice, actually finding it and getting permission would be difficult, he says.

Pinpointing data that doesn't merit any backup, he says, can greatly reduce cost and



management resources. Also, determine the data that's useful and fixed and place it in an active archive so users can still access it. He says enterprises only need to copy the data for data-protection purposes when they "ingest the data into the archive. That removes this data from the backup/restore process."

## Consider Virtual Tape, Snapshots

Virtual tape, says Quocirca founder Clive Longbottom, is one of the most widely used backup and recovery approaches.

"VTL was put in place to speed up BR [backup and restore], as backup periods were getting to be longer than the windows available to them," he says. "By backing up to disk but pretending it's a tape, backup can be speeded up immensely," as IT can check backups at disk vs. tape speeds.

Longbottom also says using snapshots rather than full

backups can provide more instant abilities for restoring a file because rather than losing everything that occurred between the last full (or incremental) backup and now, snapshots enable backing up files more regularly without overly impacting the server, storage, and network resources.

Hill recommends testing backups frequently and thoroughly enough as to instill confidence that IT can restore everything needed within SLA terms, something that's "easier said than done" because testing can't be disruptive and drain personnel resources. Software can help test on essentially a continuous basis, he says, though this can be costly.

One problem with testing is it involves the backup copy on disk or tape and servers that must run the applications that are restored, "otherwise, how do you know that it worked?," he says. "A disaster recovery site might provide the right

## Enable Self-Service

Quocirca founder Clive Longbottom advises moving from a help-desk-driven data restore model to self-service one. "Mirror a user's data with a degree of versioning in a simple manner so that the user can recover an individual file as needed from an easy front end," he says. "As far as possible, divorce the files and data from the desktop (which should be centrally hosted as a hybrid VDI model anyhow), so that should the user's device be lost, stolen, or otherwise compromised, it isn't a case of having to wait for a restore of an image onto a dissimilar device."



support,” he says. Also, if backing up to the cloud, the vendor may have testing strategies. “Unfortunately, testing often isn’t done as frequently or as well as it should be,” he says.

Schulz advises testing “beyond the component level,” or going past restoring a file, volume, or object and checking that data can be opened and used; restored to an alternate location; verified for contents, decryption, access control lists, and other security or access controls; and have permissions restored. Periodically check testing procedures to ensure you have copies and they’re the right version or generation.

### Look At Current Tech In New Ways

Hill says a market is growing for backup/recovery that meets needs related to server virtualization and backing up to the cloud. “Traditional products may or may not play in these two non-traditional markets.”

Although deduplication is a powerful, valuable trend, Hill says, “it’s not a panacea for all the changes that are happening.” He does consider software that can help monitor protected data, issue alerts when a backup fails, and work around bottlenecks as essential.

Schulz suggests enterprises use current technologies and tools in new ways rather than as replacements or using them in the same ways as predecessors.

“For example, if tape was used for hourly backups and now disk is doing that role, why is an hourly back-to-disk occurring?” Instead, consider moving to hourly or 30-minute snapshots and then a daily backup disk-to-disk or disk-to-cloud. He also suggests breaking free of using siloed data protection or having separate groups work with backup administrators in an uncoordinated manner. Align these and streamline processes in order to do more in less time and remove complexity and costs, he says.

### Aim For Business Continuity

Longbottom says enterprises should regard backup and recovery as a last resort. “The main aim should be for business continuity, which requires something a bit different to BR,” he says. BR should be more a part of an

archival strategy for government, risk, and compliance reasons, whereas areas such as accidental file deletion; accessing earlier document versions; and stolen, lost, or failing devices will require a different approach that enables rapid regain functionality through self-service.

“BR shouldn’t be regarded in the way it was, say, five years ago—it’s just a means for long-term archival of data. Now, we need to look at online and near-line data mirroring so that the business maintains operational capabilities through any issue,” he says. **P**

### Think Through Service-Level Agreements

Mesabi Group principal David Hill says thinking through SLAs—whether an agreement with users or for IT planning purposes—is critical if moving to a “true cloud where real SLAs are essential for IT as a service.” Achieving these SLAs means thinking through what QoS metrics are needed. “Notice that the SLAs with their QoS metrics aren’t the same for all applications. For example, the RTO and RPO should be more stringent for mission-critical applications than for less time-sensitive applications,” he says. This means ranking how applications will be recovered if needed, as treating all applications equally would cause data protection costs to rise.”

### BONUS TIPS:

#### Keep Things Simple

Quocirca founder Clive Longbottom says centralizing desktops through a virtual desktop infrastructure (VDI)-style approach (“well, a hybrid one including the use of application streaming or paging”) puts everything in the data center and then allows data management to be run against a more constrained set

of assets. Mirroring, combined with backup and recovery, then becomes far easier and effective for end users and the business, he says.

#### Do More Than Cut Costs

Server and StorageIO senior advisor Greg Schulz advises looking “beyond the temptation to simply cut cost around backup/data protection” and instead focus on cost removal. Also look for and eliminate

complexity, streamline processes, reduce data footprint with archiving, and use other techniques in addition to “reducing what actually gets protected with compression and dedup,” he says. “Not everything is the same in the data center or information factory—from applications, service requirements, threat risks—so why treat data protection the same for everything?,” he says.

# Boost Your Mobile Device Management

Policy & Technology Go Hand In Hand To Allow Secure, Flexible Mobile Usage

**MOST COMPANIES** rely on some form of mobile device management (MDM) to help them secure, monitor, and manage the mobile devices employees use. But managing a fleet of mobile devices involves much more than simply implementing a software solution and then leaving it alone.

A successful mobile management approach requires strong, clear policies; a variety of management and security solutions; and employee feedback. The key is to retain as much control as possible without diminishing the benefits of using mobile devices.

## Policy First, Technology Second

Some companies assume that technology is the answer

to all their problems and that simply implementing something like an MDM solution is enough. But before you even purchase MDM software or any piece of technology, you should first consider policy.

“Technology like MDM should only be implemented in order to enforce and communicate policies that are already developed,” says Mike Battista, Ph.D., consulting analyst at Info-Tech Research Group. For most organizations, he says, these policies don’t have to be complicated.

If there is not a lot of sensitive data being dealt with on mobile devices, a policy requiring a passcode and remote wipe on devices if they’re lost might



be enough, he says. But if you do have sensitive data, you may need to institute a policy where personal data needs to be separated from corporate data.

To back up this policy, you’d need a mobile content management solution or managed apps software, which Battista says is often bundled with core MDM, to create containers for different data and applications.

Battista adds that it’s crucial to make sure users and administrators are aware of policies and the technology used to enforce them. “Too often, users don’t know a policy exists until they violate it,” he says.

## Complement Your Existing Solutions With MDM

While MDM solutions are great for getting more control over mobile devices, you also need to consider the software you already have. For instance, Battista says that if your company uses a cloud service, you should encourage users to get the

service’s native application on their own mobile device. If your employees are using an unmanaged application to access sensitive data, see if a managed enterprise alternative is available. You can also take advantage of an already existing VPN connection for added security.

The main benefit of MDM is that it can “layer on top of many of these solutions to make them easier to implement or enforce,” Battista says. But keep in mind that MDM won’t solve every problem, so it must integrate and work together with your existing solutions.

Christian Kane, enterprise mobility analyst at Forrester, says that many MDM vendors are now expanding to add functionality for mobile application and content management. This means that companies can take advantage of the collaboration capabilities of smartphones, tablets, and laptops.

MDM coupled with other security and management

## Always Look Ahead

Mike Battista, Ph.D., consulting analyst at Info-Tech Research Group, says that companies shouldn’t be afraid of new technology and should instead be “forward-looking” and “keep your strategy flexible.” He also says that it’s important to regularly revisit your policies and technology. “You never know when a new innovation might change the way you do business for the better, so you have to be prepared to support every new mobile device if it becomes viable,” he says.

“This stuff changes so fast that if you blink you miss it,” Battista says. “For example, by this time next year, companies without some stance on wearable technology might seem as outdated as those whose policies still refer exclusively to flip phones. Without actively keeping up, you could fail to stop a threat, or even worse, miss out on accomplishing something awesome.”



solutions makes it much easier to control the flow of data and makes it possible to set a baseline of security across all apps, so companies don't have to individually manage each application, Kane says.

### BYOD Considerations

Bring your own device (BYOD) policies can complicate mobile device management because, Kane says, BYOD means that "IT can no longer control or dictate the device type or operating system that's being used by employees" or at least not to the same degree.

The traditional model of company-issued devices gives the business complete control over every aspect of the device, but BYOD means you have to be careful not to limit how employees use their personal device, which could discourage them from following internal policies.

Battista says that companies are increasingly worried about having too much control and "don't want to be able to destroy a user's irreplaceable personal photos with a push of a button."

One way to help avoid this is to implement the aforementioned containerization method of separating personal data from corporate data. But in some cases, you may want to consider limiting what types of devices and operating systems you will support.


### Protect Your Network

In addition to protecting devices, you also need to secure your network. This is less of an issue for businesses that only support a company-issued device policy because they have total management control, but it's certainly a larger issue for companies that allow BYOD.

Battista recommends that data center managers speak to their current networking vendor to see if there's anything it can do to beef up security. Another option is to skip the internal network and go with cloud resources or use a VPN connection specifically for mobile devices, he says. Both of these approaches would prevent access to the internal network and its resources.

Kane adds that "data center folks are going to have to think about where data lives and how accessible it is" in response to BYOD and network connectivity.

"More devices means more mobile apps will be used eventually and that means

there will be a greater need for access to relevant data and databases," he says. "The team should be working and communicating closely with internal app and development teams to understand what initiatives are under way and what future plans are." 

### Be Prepared For Potential Employee Use Cases

"First and foremost, companies need to understand that mobile devices are only really useful if they give employees access to the tools and data they need to get their jobs done," says Christian Kane, enterprise mobility analyst at Forrester.

"While employees might be asking today to be able to use their [mobile] device, what they're really asking is to use their devices for email, applications that help them with their job, and access to their files," he says. "MDM only really scratches the surface here, and companies are going to have to address application and data access on these devices, as well."

### BONUS TIPS:

#### Start Small

With BYOD, start with trials and pilot programs, says Christian Kane, enterprise mobility analyst at Forrester. Start by supporting the mobile devices you are most comfortable with. Your IT department will be experienced with those devices, understand their weaknesses, and know the right level of control needed to secure them. The same approach goes

for new technologies. Make sure you are familiar with how to use management solutions. You don't have to purchase an MDM solution with every bell and whistle already intact. Instead, you can pick and choose what you currently need and then "slowly expand and tweak your policies and strategies."

#### Avoid Excessive Controls

It's easy to overburden employees with policy. It's important to

protect data and secure devices, but don't make it inconvenient to use those devices. "Think through policies carefully," says Mike Battista, Ph.D., consulting analyst at Info-Tech Research Group. "Don't automatically err on the side of exerting more control, because especially with BYOD, you need to balance protecting corporate data with protecting personal data, and do so without destroying flexibility and eradicating the whole point of BYOD."

# BUYING TIPS: Storage



**YOU SPEND A LOT OF MONEY** on storage, and you need to make sure every dollar you spend is a good investment. With so many options available, including cloud, in-house, or some combination of both, it's more important than ever to have a solid understanding of what's available and what's most important for your enterprise.

## Do Your Homework & Know Your Goals

When narrowing your storage options, careful research is invaluable. "Do your homework, but don't over-analyze," says George Crump, senior analyst at Storage Switzerland. Crump suggests discussing your project with one systems vendor, one new-but-established vendor focused on the mid-range, and one startup.

Crump says you should have a clear goal. "Do [you] need more capacity, more performance, better data protection, [or] some or all of the above?," he asks. Be clear about your company's business requirements, business strategy, and networking strategy, including bandwidth requirements and available facilities and services.

Greg Schulz, senior advisor at Server and StorageIO, recommends stepping back from comparing tools and technologies initially and instead reviewing service-level objectives and requirements, including RTO

and RPO. Also be sure to give serious thought to how much of the new storage could be in the cloud, whether public (third-party) or private (in-house).

## Inventory Your Data

Have a clear understanding of your data and requirements. Inventory the type of data you have today—how much is in databases, email, files, and other formats. Crump says a good set of storage analysis tools can help you evaluate how you're currently using your IT resources.

## Spend What's Needed

Storage can be expensive, but you get what you pay for. "While everyone wants to spend pennies to save dollars, real data protection may cost dimes, not pennies—but you'll still be saving dollars," says Jason Buffington, senior analyst with Enterprise Strategy Group.

Often, management may underestimate the financial impact downtime or lost data has until it's too late, he says. "In today's market, that may mean losing a key client or potentially being unable keep the doors open just because you can't get your data back," he says.

## Consider Outsourcing Storage Management

Mike Karp, vice president and principal analyst at Ptak,

Noel, and Associates, says for small to mid-sized enterprises, most often the best option is outsourcing storage management, particularly where getting the most out of your storage and doing it with the greatest efficiency is concerned.

"Third-party providers often have a huge competitive advantage when it comes to

providing storage services, and if an IT manager can make a good business case for outsourcing many of the storage responsibilities . . . they can spend more time doing the things that they do best and offload the things that they can't do with greater efficiency to somebody who can do them in a cost-effective manner."

## CHECKLIST

Here are some things to keep in mind as you formulate your storage strategy:

**Data safety.** Keeping your precious data safe is vital to profitability, so be sure to implement redundancy and strong error correction, as applicable.

**Uptime.** You need reliable devices and software, along with failover protection (both emergency power and redundant data storage systems). You'll also need support from the vendors, relevant manufacturers, and/or developers.

**Security.** Consider all elements, including user access policy, encryption, firewalling, and malware prevention.

**Speed.** How fast your storage works is important. SSDs will have a role in most data centers.

**Manageability.** Your organization may require new software for storage management, data protection, support, and future storage planning.

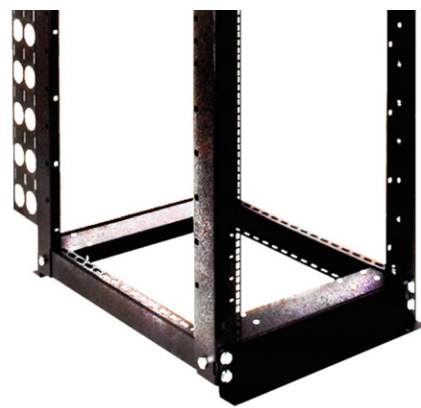
**Cost-effectiveness.** Think not only in terms of cost per gigabyte, but also cost per IOPS. Deduplication, virtualization, and provisioning features can help you avoid wasting money and power on unnecessary drives.

**Scalability.** Whichever path you take, make sure the result will let your data center grow with your organization's needs.



## BUYING TIPS:

# Data Center Racks & Cabinets



**RACKS AND CABINETS** hold and protect every piece of equipment that runs your data center, so don't rush the decision about which cabinet to purchase. Instead, focus on the most important features and ensure the cabinet will fulfill your needs for years to come.

### Know What's On The Market

Start by researching what's on the market. There are full-sized, midsized, and smaller cabinets as well as racks with heights of 30 to 84 inches and widths of 24 to 36 inches.

A common mistake is buying the typical base 42U, 600mm-wide, 1,050mm-deep configuration that is the most popular rack and just assuming it will work for your specific configuration, says Craig Watkins, product manager at Tripp Lite (773/869-1234; [www.triplite.com](http://www.triplite.com)).

"Maybe they require a rack that's taller than typical. Maybe they need a rack that is a wide or deep version. And is a black rack the way to go? When installing equipment, can the rails be adjusted?" A color other than black, Watkins says, can make tasks such as connecting servers and other equipment easier and cut down on mistakes.

Eli E. Hertz, CEO and president of Hergo (888/222-7270; [www.hergo.com](http://www.hergo.com)), says to look for potential add-on items, such as overhead storage compartments, power and cable

management solutions, and back and side panels. Different sized racks and cabinets paired with additional solutions can help you design a product that's perfect for your data center.

### Pinpoint Your Needs

"Establish what you need the cabinet to do," says Susan Wynne, senior sourcing specialist for Rackmount Solutions (866/207-6631; [www.rackmountsolutions.net](http://www.rackmountsolutions.net)). "If the equipment is noisy, you may want a sound reduction cabinet. If the environment is dirty, you may need a filtered cabinet. Even the area of the country is important, and you may need an air-conditioned or NEBS cabinet."

Other considerations include whether you have a sprinkler-based fire suppression system that requires NEMA 12 certified cabinets that keep out moisture, Wynne says. You should also consider built-in security measures, such as locked cages or other alternatives, if there is a lot of traffic in your data center.

### Get The Right Fit

In most cases, you've decided which pieces of equipment to buy for your data center before you start shopping for the racks and cabinets to store them in. It's a great opportunity to measure each piece and come up with a mock configuration for how it will fit into the rack or cabinet. "This ensures

the cabinet is tall enough, wide enough, and deep enough to handle the longest piece of equipment to be populated into the cabinet," Wynne says.

But be careful you don't populate the racks or cabinets with more equipment than you can reasonably concentrate in one area, says Ken Koty, sales engineer at PDU Cables (866/631-4238; [www.pducables.com](http://www.pducables.com)). A higher density of equipment creates more heat and possible hot spots. "Make sure your cooling equipment can adequately cool the equipment before you put it all in one spot."


The amount of space the rack or cabinet takes up is equally important. "Make sure the outside dimensions of the cabinet will fit in the designated location," Wynne says. Leave adequate space for future

expansion. If you don't, you could get stuck with a cramped and inefficient data center with no room for evolution.

### Check For Airflow

If you are utilizing raised floors and CRAC units, having vents or grills to allow airflow through the structure is essential, Koty says. "Look for server cabinets that provide good ventilation. Make sure that the cabinets draw cold air from the front and discharge in the back to enable a hot/cold-aisle configuration."

### Research The Vendor

The decision of which vendor to buy from is significant, Hertz says. Companies should be able to "grill the supplier on what they are actually going to be getting." The vendor should know "the product from nuts to bolts." 

## CHECKLIST

**Cable management.** Is cable management built-in, or does the rack or cabinet leave adequate space to neatly route cables?

**Mounting.** Does the rack/cabinet provide PDU mounting options such as brackets?

**Special requirements.** Does the equipment you're mounting require tapped or M6 holes?

**Check for fit.** Will you need to disassemble the rack/cabinet to get it in the room?

**Security.** Is the cabinet lockable to prevent potential security issues?

# BUYING TIPS: Colocation Providers

**WHEN SELECTING A** colocation provider, it's crucial to get it right the first time, says Darin Stahl, Info-Tech Research Group lead analyst.

"When you get into a colocation, switching costs are enormous," he says. "This isn't like buying a bunch of photocopiers, being unhappy with them, and putting them to the curb and getting new [copiers] in. It's a big deal to go through switching." To find a good fit with a colocation provider, consider the following.

## Understand The Options

Stahl says the colocation/managed service provider market can be categorized into three tiers. Tier one vendors typically have significant market influence and enormous geographic scale, he says. Tier two vendors generally have the same qualifications but less market influence and possibly less geographic scale. Tier three vendors are basically everyone else, he says.

Although price is a factor when comparing providers, it shouldn't be the driving factor. Smaller colocation providers that compete on price and don't own their facility typically can't offer an iron-clad SLA around the actual facility, Stahl says.

Lynda Stadtmueller, program director for cloud computing services at Frost &

Sullivan's Strategcast division, agrees, adding, "There's too much at stake . . . to go low bid." Colocation, she says, "is not a commodity; every provider has different configurations, capacity, processes, and systems that can seriously impact your applications."

## Consider Usage & Location

Be sure to consider how you want to use the facility and for what purpose. Some companies invest in colocation so they can cut down on internal data center and infrastructure costs while others hope to set up a safe solution for disaster recovery. Once you know how you intend to use equipment in your colocation environment, you can then find the best location.

## Make Sure There Is Room For Growth & Expansion

Although it's important to put a heavy focus on what your company needs now in terms of equipment and performance, it's also crucial to look to your company's potential future needs and ensure there is enough room for expansion years down the road. Instead of backing yourself into a corner, make sure your colocation provider's facility is flexible enough to support more or less equipment depending on whether you wish to expand or consolidate at a later date.



## Know The Reputation Of Your Provider & Its Facility

Checking a colocation provider's past history is as important as making sure it's in a safe location. Request customer referrals whenever possible and gather as much information as you can about the provider before you make your decision.

## Check The SLA

"Be sure to compare the SLA to the services you are planning to use," says Brett Femrite, sales manager at Rackmount Solutions (866/207-6631; [www.rackmountsolutions.net](http://www.rackmountsolutions.net)). "Some SLAs have varying levels of coverage based on the services that you choose. Be

sure to note whether there is a redundant service offering that you must opt in to use in order to be fully covered by the SLA. Examples include A/B power or redundant network connections."

Stahl says to push for the contract to include an annual services review and ability to right-size or contract services so you don't pay for capabilities you don't need. Some of the best vendors do this upfront, he says.

Conduct a quarterly operations-style meeting with the vendor to discuss what you did in the space during that time, what worked and didn't, and what you have planned. Ask the vendor to do likewise, which may result in learning the vendor's scheduled outages. **P**

## CHECKLIST

**Ownership.** Does the provider own the facility itself or does it lease it from another company, potentially complicating the issue?

**Plans.** What are your short- and long-term plans for colocation? Does the provider have options in place for your potential company growth and expansion?

**Determine your needs.** Before starting to compare providers, know how much power and space you need. This will ensure you can make apples-to-apples comparisons in terms of rates and capabilities.

**Make sure support is available.** Does the facility offer 24/7/365 customer service? If so, what's the response time like both during and after hours? Try testing out the technical support and customer service before committing to the provider.



## BUYING TIPS:

# DCIM Solutions

**DATA CENTER MANAGERS** are eyeing data center infrastructure management (DCIM) solutions for the numerous benefits they can offer by providing a holistic view of data center and facilities infrastructures. Here are some of the key elements to consider when purchasing a solution.

### Know What DCIM Can Do

DCIM solutions enable IT to view real-time power and temperature usage data on a granular level and provide monitoring, management, automation, optimization, and capacity and budget planning capabilities, all of which lead to the streamlining of operations and improving energy consumption and overall efficiency. Along with that real-time, holistic view into power, cooling, and other IT and physical assets, you'll get documentation, control, visibility, and metrics tools all in one solution.

DCIM solutions can replace spreadsheets, paper records, CAD drawings, and similar tools traditionally used to track assets. You'll gain real-time, in-depth views into physical and IT assets because, with DCIM, you'll have a firm understanding of where your infrastructure assets exist and where spare capacity exists.

Other benefits include quick completion of company-required changes; the ability to receive complete capacity data for power, rack units, cooling, chassis, and network capacity

consolidated into one system; less downtime; and precise views of capacity, trend, and environmental data for everyone to access.

### Find The Right Product To Meet Your Needs

When comparing DCIM solutions, be sure to consider what your greatest need is and your ability to fully use the platform's tools. For example, determine whether you have the resources in place to address issues the DCIM solution uncovers and change the facility or operating procedures to enable improvements.

The maturing of the DCIM market means there are products suitable for even small enterprises. When evaluating vendors, look for ones that have forged strong links with the leading enterprise IT management vendors. In some cases, your existing power vendors may offer solutions. This would be a good starting point as you already trust them as vendors.

Greg Schulz, senior advisor at Server and StorageIO, says to pay attention to holistic DCIM solutions that expand beyond traditional facilities power, cooling, assessment, and management. Having insight on server, storage, networking, hardware, software, and services along with a facility's use and service levels enables making informed decisions on where to deploy




SSD/flash, blade servers optimized for energy-efficient virtualization, and private clouds along with other popular buzzword themes, Schulz says.

Don't forget that, with whatever DCIM application you choose, you need to have the infrastructure support to run and maintain the application, says Alex North, director of business development at BayTech (800/523-2702; [www.baytech.net](http://www.baytech.net)).

### Seek An Easy Migration

Rather than re-creating the wheel, seek out a DCIM solution that supports easily migrating existing data to the new system, says Brett Femrite, director of business development at Rackmount Solutions

(866/207-6631; [www.rackmountsolutions.net](http://www.rackmountsolutions.net)). For example, if you're maintaining multiple spreadsheets, CAD drawings, and other diagrams, he says, "migrating that information into the DCIM solution easily will be a lifesaver."

The solution should allow data center managers to start small and work up to added levels of sophistication in phases, he says. "Flexibility can breed complexity, and while a full-featured DCIM solution can seem complicated, getting started doesn't have to be." A modular solution that enables initially buying what's needed and layering in additional features gradually is a nice benefit. 

## CHECKLIST

**Plan for the future.** A DCIM solution should support capacity and optimization planning, offering tools that help "determine future requirements for power, cooling, floor space, rack space, and contingency planning," says Brett Femrite, director of business development at Rackmount Solutions (866/207-6631; [www.rackmountsolutions.net](http://www.rackmountsolutions.net)).

**Know what you're up against.** Possible obstacles to acquiring a DCIM solution can include the company's finance department vetoing the purchase; departments having different solutions in mind, leading to paralysis; vendors not providing a solution priced for the small to midsized enterprise; lack of manpower needed to learn, implement, and oversee the solution; and poor or slow solution support. Before investing in DCIM, know how you'll handle these obstacles.

# Network With Your Peers

## At These IT Training & Association Meetings Across The United States

### SEPTEMBER

#### **AITP Richmond**

Sept. 10  
Hilton Garden Inn at Innsbrook  
4050 Cox Road  
Glen Allen, Va.  
[www.aitprich.org](http://www.aitprich.org)

• • • • •

#### **AITP Wheeling**

Sept. 11  
White Palace at Wheeling Park  
1801 National Road  
Wheeling, W.Va.  
[www.aitp-wheeling.org](http://www.aitp-wheeling.org)

• • • • •

#### **AFCOM Potomac**

Sept. 12  
Augustine Golf Club  
76 Monument Drive  
Stafford, Va.  
[www.afcom.com](http://www.afcom.com)

• • • • •

#### **AITP Washington, D.C.**

Sept. 12  
Alfio's La Trattorio Restaurant  
4515 Willard Ave.  
Chevy Chase, Md.  
[www.aitpdc.org](http://www.aitpdc.org)

#### **BICSI Fall Conference**

Sept. 15-19  
MGM Grand Hotel  
3799 Las Vegas Blvd.  
Las Vegas, Nev.  
[www.bicsi.org](http://www.bicsi.org)

• • • • •

#### **CompTIA Network Certification**

Sept. 16  
New Horizons Lexington  
1050 Chinoe Road  
Suite 208  
Lexington, Ky.  
[www.nhlexington.com](http://www.nhlexington.com)

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#### **AFCOM Greater Tampa Bay Chapter**

Sept. 18, 12:30 to 4 p.m.  
[www.tampabayafcom.com](http://www.tampabayafcom.com)

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#### **AITP Northeastern Wisconsin**

Sept. 18  
Holiday Inn Appleton  
105 S. Nicolet Road  
Appleton, Wis.  
[new.aitp.org/eventsmeeting-info](http://new.aitp.org/eventsmeeting-info)

#### **AITP Twin City**

Sept. 19, 7 p.m.  
Ozark House Restaurant  
704 McGregor St.  
Bloomington, Ill.  
[www.aitp.org/members/group\\_content\\_view.asp?group=75779&id=125369](http://www.aitp.org/members/group_content_view.asp?group=75779&id=125369)

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#### **Cisco CCNP Security Certification Training Course**

Sept. 21  
Institute of Professional Learning  
500 W. Cypress Creek Road  
Ft. Lauderdale, Fla.  
[www.iplearning.net](http://www.iplearning.net)

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#### **AITP Akron**

Sept. 24  
Akron, Ohio  
[www.akron-aitp.org](http://www.akron-aitp.org)

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#### **ISSA Inland Empire**

Sept. 24, 11:30 a.m. to 1:30 p.m.  
Upland, Calif.  
[ie.issa.org](http://ie.issa.org)



**AITP  
California Southland**

Sept. 25  
Garden Grove, Calif.  
[www.aitpcalsouthland.org](http://www.aitpcalsouthland.org)

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**ISSA  
Baltimore**

Sept. 25  
Concurrent Technologies Corp.  
8530 Corridor Road  
Savage, Md.  
[www.issa-balt.org](http://www.issa-balt.org)

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**Data Center  
World**

Sept. 29-Oct. 2  
Orlando World Center Marriott  
Orlando, Fla.  
[www.datacenterworld.com](http://www.datacenterworld.com)

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**Deploying  
Windows Server 2008**

Sept. 30  
New Horizons  
Tysons Corner  
2010 Corporate Ridge  
Suite 200  
McLean, Va.  
[www.dcnewhorizons.com](http://www.dcnewhorizons.com)

**Interop**

Sept. 30-Oct. 4  
Javits Center  
New York, N.Y.  
[www.interop.com](http://www.interop.com)

**OCTOBER**

**AITP Wheeling**

Oct. 9  
White Palace at Wheeling Park  
1801 National Road  
Wheeling, W.Va.  
[www.aitp-wheeling.org](http://www.aitp-wheeling.org)

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**AITP Fall  
Region 5 Conference**

Oct. 10  
The Chateau  
1601 Jumer Drive  
Bloomington, Ill.  
[www.aitp.org/group/905](http://www.aitp.org/group/905)

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**AITP Region 5  
Leadership Workshop**

Oct. 11  
The Chateau  
1601 Jumer Drive  
Bloomington, Ill.  
[www.aitp.org/group/905](http://www.aitp.org/group/905)

**AITP  
Washington, D.C.**

Oct. 10  
Alfio's La Trattorio Restaurant  
4515 Willard Ave.  
Chevy Chase, Md.  
[www.aitpdc.org](http://www.aitpdc.org)

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**AITP Richmond**

Oct. 15  
Hilton Garden Inn at Innsbrook  
4050 Cox Road  
Glen Allen, Va.  
[www.aitprich.org](http://www.aitprich.org)

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**AITP  
Southwest Missouri**

Oct. 15  
High Street Baptist Church  
900 N. Eastgate Ave.  
Springfield, Mo.  
[aitpspringfield.org/main.html](http://aitpspringfield.org/main.html)

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**AITP Northeastern  
Wisconsin**

Oct. 16  
Holiday Inn Appleton  
105 S. Nicolet Road  
Appleton, Wis.  
[new.aitp.org/eventsmeeting-info](http://new.aitp.org/eventsmeeting-info)

**Do you have an event you'd like to see listed?  
Send an email to [feedback@processor.com](mailto:feedback@processor.com).**

# PROCESSOR<sup>®</sup>

## Solutions Directory

Here are brief snapshots of several companies offering products designed for the data center and IT industry. Listings are sorted by category, making it easy for you to find and compare companies offering the products and services you need.

You can find more detailed information on these companies and the products they offer inside this issue.

**To list your company and products,  
call (800) 247-4880.**

### PHYSICAL INFRASTRUCTURE



Since 1979, Simplex Isolation Systems has been setting new design standards in modular expandable cleanroom components, isolation curtains, hardware, and new product development. Fontana, Calif.,-based Simplex's unique strip doors and mounting systems are designed for quick installation. Simplex parts and materials perform with optimum efficiency, last longer, and save you money. And with Simplex, you are always backed by industry expertise, product knowledge, and the best warranties in the market.

#### Products Sold:

- Cleanrooms
- Enclosures
- Strip doors
- Curtains

(877) 746-7540 | [www.simplexisolationssystem.com](http://www.simplexisolationssystem.com)

### PHYSICAL INFRASTRUCTURE



Founded in 1985, Raritan has become a leading provider of power and energy management, DCIM and KVM solutions. Our products are in use at more than 50,000 locations worldwide, including eBay, Cisco, Intel, NASA, and the United States Post Office, giving IT departments the tools they need to increase power management efficiency, better manage data center changes, improve data center productivity and enhance branch office operations.

#### Products Sold:

- Intelligent Rack Power Distribution Units
- Energy Management Software
- Data Center Infrastructure Management
- KVM and Remote Access Management

(732) 764-8886 | [www.raritan.com](http://www.raritan.com)

### PHYSICAL INFRASTRUCTURE



As an integrator and master distributor providing quality power solutions, HM Cragg has built a reputation as the company that delivers innovation to aid and satisfy its customers. HM Cragg was founded in 1968 and is 100% employee-owned, focusing on quality people and exceptional products.

#### Products Sold:

- AC and DC power solutions (UPSes, power distribution)
- Control and monitoring (environmental and power)
- Connectors and cables (cord sets, ePDU cables)
- Cooling and Racks (airflow management, portable cooling)

(800) 672-7244 | [www.hmcragg.com](http://www.hmcragg.com)

### PHYSICAL INFRASTRUCTURE



Rackmount Solutions' mission is to listen to the IT engineer's specific needs and deliver superb-quality, high-performance products through continuous product innovation and operational excellence. We pride ourselves in providing quality customer service, products that fit your IT requirements, and solid value for your money.

#### Products Sold:

- Wallmount and server racks and cabinets
- Desktop/tabletop portable racks
- Shockmount shipping cases
- Bulk cable

(866) 207-6631 | [www.rackmountsolutions.net](http://www.rackmountsolutions.net)

### PHYSICAL INFRASTRUCTURE



Founded in 1995, Austin Hughes Electronics Ltd. is a design and manufacturing group that offers a broad range of solutions based around 19-inch rack-mount technology. With a wealth of experience, Austin Hughes design and development teams are focused to rapidly transform customer requirements and market trends into saleable solutions.

#### Products Sold:

- Infra solution Cabinet Smartcard Handles
- InfraPower Cabinet Intelligent PDUs
- CyberView Rackmount KVM & LCD Console Drawer
- Environmental Sensors

(510) 794-2888 | [www.Austin-Hughes.com](http://www.Austin-Hughes.com)

## PHYSICAL INFRASTRUCTURE



Geist is a leading data center provider for power strips, monitoring equipment, cabinet containment and in-rack cooling, and DCIM systems. Geist's power strips are tailored to meet each client's needs and provide unbeatable performance in the data center. Our industry-leading monitoring and cooling solutions increase data center efficiencies and make going green easier than ever before.

### Products Sold:

- Power
- Cooling
- Monitor
- Management

(800) 432-3219 | [www.geistglobal.com](http://www.geistglobal.com)

## PHYSICAL INFRASTRUCTURE



Cablesys, headquartered in La Mirada, California, is a leading manufacturer of high performance fiber cables, fiber jumpers, CAT 6 patch cords, CAT 5e patch cords, CAT 6 cables and connectivity solutions. We have millions in stock that can be shipped same day and best of all, 20% less than name brands.

### Products Sold:

- Fiber Optic Cables
- Fiber Patch Cords
- Networking Patch Cords
- Telephone Line Cords
- Audio and Video Cables

### Custom Cable Assemblies:

- Pre-bundled Cable Assemblies
- Trunk Cable Assemblies
- Multi-strand Cable Assemblies
- Pre-labeled and Pre-kitting
- OEM Cable Assemblies

(800) 555-7176 | [Cablesys.com/pro](http://Cablesys.com/pro)

## PHYSICAL INFRASTRUCTURE



Server Technology is committed to the PDU market with the largest group of engineers dedicated to power distribution and other solutions within the equipment cabinet. Advancements in device power monitoring help data centers monitor and improve their efficiency, and continuous research and development is fueled by companies that look to Server Technology for their custom cabinet power solutions.

### Products Sold:

A complete line of cabinet PDUs, including Per Outlet Power Sensing (POPS), Rack Mount Fail-Safe Transfer Switch, Console Port access with remote power management, Switched, Smart, Metered, Basic, and -48 VDC

(800) 835-1515 | [www.servertech.com](http://www.servertech.com)

## PHYSICAL INFRASTRUCTURE



RackSolutions has been serving the data center market for more than 10 years. All of our products are designed, engineered, built, and shipped under our own roof. We have product solutions available for every major OEM, but if one of our existing products doesn't fit your needs, our top-notch mechanical and electrical engineers can create the item you need from scratch, solving even the toughest installation design challenges. Best of all, we typically don't charge up-front fees for design services.

### Products Sold:

- Computer Server Racks
- Cabinets and Shelves
- Mounting Products

(888) 903-7225 | [www.racksolutions.com](http://www.racksolutions.com)

## PHYSICAL INFRASTRUCTURE



BayTech was founded in 1976 and, since the 1990s, has developed unique products for remote power management. The company uses printed circuit board instead of wires for a better, more resilient connection between the data center equipment and the receptacle. BayTech provides an extensive Web site with brochure downloads, warranty information, and reseller support and also offers evaluation units for data centers.

### Products Sold:

- Power control, distribution, management, and metering
- Power transfer switches
- Console management and remote site management

(800) 523-2702 | [www.baytech.net](http://www.baytech.net)

## PHYSICAL INFRASTRUCTURE



PDU Cables is the leading supplier of power distribution cables assemblies to data centers in North America. PDU Cables has been serving this industry since 1981 and is the first independent cable assembly company to introduce colored conduit into the power distribution cable market, the first to get UL 478 listing, and the first to introduce the Power Cable and Equipment Configurator software tool. The company is centrally located in Minneapolis, Minn., allowing it to offer 24-hour turnaround and shipping time of just one or two days to almost any United States destination.

### Products Sold:

A range of power cables, cable seals, and power cord assemblies.

(866) 631-4238 | [www.pducables.com](http://www.pducables.com)



## PHYSICAL INFRASTRUCTURE



LINDY USA specializes in cables, adapters, electronics, and accessories for computer, networking, and audio video applications. Since 1932, Lindy has supplied high-quality interconnects to customers in commercial, telecom, and residential markets. What sets us apart is our complete dedication to innovation, performance, and reliability. Our cabling products are truly outstanding.

### Products Sold:

- Networking Products
- Sharing, Converting, Extending
- Hardware and Security
- Cables
- Audio / Video
- USB and FireWire
- Add-On Cards
- Adapters
- KVM
- Input Devices
- Power
- Much more!

(888) 865-4639 | [www.lindy-usa.com](http://www.lindy-usa.com)

## PHYSICAL INFRASTRUCTURE



C.E. Communication Services (CE COMM) distributes, markets, designs, and manufactures Data Center products, specializing in Network Infrastructure, Cable and Wire Management, and Fiber and Copper Cabling.

### Products Sold:

- Patented Cable Management Systems for CISCO Catalyst and all 1U Switches
- Standard & Custom Data Center Cable Assemblies: Copper CAT5E, CAT6 & 6A
- High Density Optical Fiber Assemblies
- Fiber Connectivity, Fiber Test - Inspection and Media Conversion Equipment

(866) 966-1555 | [www.cecommunication.com](http://www.cecommunication.com)

## PHYSICAL INFRASTRUCTURE



Sensaphone has been designing and manufacturing remote monitoring systems for more than 25 years and has more than 300,000 of its products in use. Sensaphone's product lineup offers a full range of devices with a broad number of features and applications designed to monitor your entire infrastructure and alert you to changes. All product engineering functions, including hardware and software design and circuit board layout and assembly, are performed at the Sensaphone facility in Aston, Pa.

### Products Sold:

Remote monitoring solutions that provide email and voice alarm notification for problems related to temperature, humidity, water detection, power failure, and more.

(877) 373-2700 | [www.sensaphone.com](http://www.sensaphone.com)

## PHYSICAL INFRASTRUCTURE



Based in New York City, Hergo Ergonomic Support Systems is an independent designer and manufacturer of enclosure cabinet solutions, technical computer furniture, and modular racking systems. The company's products are designed to promote organization in the workspace and to increase the productivity of computers, peripherals, and communications equipment. Hergo is known for its high-quality products and superior customer service.

### Products Sold:

- Racks
- Enclosures/cabinets
- Motorized workstations
- Flat-panel arms
- Computer desks
- Cable management
- Power management

(888) 222-7270 | [www.hergo.com](http://www.hergo.com)

## PHYSICAL INFRASTRUCTURE



Atlas has specialized in portable air conditioning since 1979 and leads the industry in server room and data center portable cooling. We offer "24/7" response from company-owned, full-service offices around the country, each stocked with a wide inventory of equipment for primary, supplemental, or emergency cooling. All portable items are available for sale or rental. Atlas is a Preferred MovinCool® Distributor and a GSA Certified MAS Contractor.

### Products Sold:

- 1-5 ton portable air conditioners, air and water-cooled
- 12-ton portable coolers designed to roll through a standard doorway
- Ceiling-mount air conditioners – full line of MovinCool® packaged a/c units

(800) 972-6600 | [www.AtlasSales.com](http://www.AtlasSales.com)

## PHYSICAL INFRASTRUCTURE



AVTECH Software, founded in 1988, is focused on making the monitoring and management of systems, servers, networks, and data center environments easier. AVTECH provides powerful, easy-to-use software and hardware that saves organizations time and money while improving operational efficiency and preparedness. AVTECH products use advanced alerting technologies to communicate critical status information and can perform automatic corrective actions.

### Products Sold:

A full range of products that monitor the IT and facilities environment, including temperature, humidity, power, flood, room entry, and UPS.

(888) 220-6700 | [www.AVTECH.com](http://www.AVTECH.com)

## PHYSICAL INFRASTRUCTURE

# CORNING

Corning Cable Systems is a leading manufacturer of fiber optic communications solutions for voice, data, and video network applications worldwide. We offer the broadest range of end-to-end connectivity solutions for customers' telecommunications networks. We put companies at the forefront of network innovation, pioneering many of the global products and solutions commonly used in state-of-the-art cabling systems.

### Products Sold:

- Cabling

(607) 974-9000 | [www.corning.com](http://www.corning.com)

## PHYSICAL INFRASTRUCTURE



Tripp Lite is a leading manufacturer of products that power, connect and protect computers and other electronics. Founded in 1922, it is best known for its Uninterruptible Power Supply (UPS) Systems and Isobar® Surge Suppressors (with over 18 million sold).

### Products Sold:

- UPS Systems
- UPS Batteries
- PDUs
- Cables
- Surge Protectors
- KVM Switches
- Power Inverters
- Racks & Enclosures

(773) 869-1234 | [www.tripplite.com](http://www.tripplite.com)

## PHYSICAL INFRASTRUCTURE



ITWatchDogs manufactures environmental monitors that help prevent downtime from climate- and power-related issues. Its Web-enabled monitors let users keep an eye on remote conditions from a secure Web interface and receive SNMP, email, SMS, and voice call alerts when specified alarm thresholds are exceeded for external factors, including temperature, humidity, airflow, power failure, smoke, water detection, and more.

### Products Sold:

- Climate monitors
- Power monitors
- Digital and analog sensors
- IP surveillance cameras

(512) 257-1462 | [sales@itwatchdogs.com](mailto:sales@itwatchdogs.com) | [www.itwatchdogs.com](http://www.itwatchdogs.com)

## PHYSICAL INFRASTRUCTURE



PDUDirect.com is a Master Distributor of select Server Technology PDUs for server and networked environments. PDUs Direct's basic, metered, and switched Rack PDUs provide local and remote power management, power monitoring, and environmental monitoring. We pride ourselves in offering industrial-grade quality products at the lowest prices, with the fastest shipping (most orders shipped within 24 hours) and simplest purchase process. We are the Power Behind the Business.

### Products Sold:

A complete line of metered and basic PDUs, and 20A switched PDUs.

(888) 751-7387 | [pdusdirect.com](http://pdusdirect.com)

## SECURITY



Get professional results without needing the professional. Everything you need is included, and no specialized network or camera knowledge is required. Simply plug a VIAAS camera in and great video is reliably recorded. Log in to your secure [vias.com](http://vias.com) account to access it.

### Products Sold:

A professional-grade video surveillance and monitoring system that encrypts and stores video on the camera, then uses smart bandwidth technology to send the video to the VIAAS cloud for long-term storage.

(408) 342-5570 | [www.VIAAS.com](http://www.VIAAS.com)

## SERVERS



Chenbro is a leader in enclosure solutions, selling its products primarily to system integrators and OEM and channel partners. The company's extensive research and development efforts help it to keep its competitive edge and maintain market leadership, with special focus on thermal, EMI, and acoustic solutions. Taiwan-based Chenbro has offices in the United States, UK, The Netherlands, and China.

### Products Sold:

- A comprehensive line of PC chassis, server/workstation chassis, rackmount chassis, and HDD enclosures.

(909) 947-3200 | [www.chenbro.com](http://www.chenbro.com)

## SERVERS



Intel Intelligent Systems Alliance Premier member American Portwell Technology is a wholly owned subsidiary of industrial computer innovator Portwell of Taiwan. It's known for its custom solutions as well as for its rack-mount and embedded computers used in industrial, medical, retail, financial, semiconductor equipment, mission-critical, and network security environments.

### Products Sold:

- Embedded, single-board, and rackmount computers
- specialty platforms
- human-machine interfaces
- communication appliances

(510) 403-3399 | [www.portwell.com](http://www.portwell.com)

## SERVERS



ServerMonkey stocks and delivers new and refurbished servers and networking equipment. Our blend of low prices, high quality, and exceptional service offers a unique opportunity for corporate IT groups to economize without compromising.

### Products Sold:

- Dell, HP, and other Servers
- Workstations
- Storage
- Processors
- Server Accessories

(713) 430-2182 | [www.servermonkey.com](http://www.servermonkey.com)

## SERVERS



Supermicro® (NASDAQ: SMCI), the leading innovator in high-performance, high-efficiency server technology, is a premier provider of advanced server Building Block Solutions® for enterprise IT, data center, cloud computing, HPC, and embedded systems worldwide. Supermicro is committed to protecting the environment through its "We Keep IT Green®" initiative by providing customers with the most energy-efficient, environmentally-friendly solutions available on the market.

### Products Sold:

- Servers
- Network switches
- GPU servers
- Motherboards
- Storage solutions
- Embedded
- Chassis
- Blade servers

(408) 503-8000 | [www.supermicro.com](http://www.supermicro.com)

## CLIENTS



The Smart Choice for Text Retrieval® since 1991, dtSearch has provided enterprise and developer text retrieval along with document filters for over 22 years. Supported data types include databases, static and dynamic website data, popular "Office" formats, compression formats and email types (including the full-text of nested attachments). dtSearch products meet some of the largest-capacity text retrieval needs in the world; the company's website includes hundred of developer case studies and reviews.

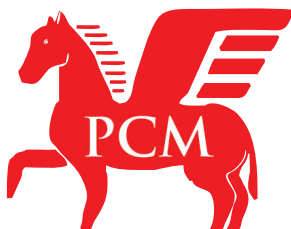
### Products Licensed:

Text retrieval products, including:

- Desktop with Spider
- Network with Spider
- Publish (for portable media)
- Web with Spider
- Engine for Win & .NET
- Engine for Linux

(800) IT-FINDS | [www.dtsearch.com](http://www.dtsearch.com)

## EQUIPMENT DEALER



In 1987, Pegasus Computer Marketing started providing mainframe products to the end-user market. What began as a sales-only organization soon adapted to offer in-house repair and refurbishment. During the past 10 years,

### Products Sold:

- We buy, sell, and service:
- Point-Of-Sale Equipment and POS/PC Flat Panels
  - Wired and Wireless Barcode Hardware
  - Kronos Time Clocks and Accessories

(800) 856-2111 | [www.pegasuscomputer.net](http://www.pegasuscomputer.net)

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It's as easy as:

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  - Find Vendors
  - Post A Free Want-To-Buy
  - Post A Free For-Sale Listing

3. Follow the on-screen directions from there!

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